Smile

SERVICE MANUAL

CA-2011
CA-2111

SMILE Technologies GmbH.

MC-Service

SPEC. NO.	SHEET	OF SHEETS
CA-2011/2111	1	4

SERVICE MANUAL

FOR

20" ` 21" . COLOR MONITOR

CA-2011 CA-2012 CA-2111

CONTENTS

1. ADJUSTMENT
2. TROUBLE SHOOTING
3. VR LOCATION
4. BLOCK DIAGRAM
5. SCHEMATIC DIAGRAM

20" AND 21" Color Monitor Maintenance Guide

I. Introduction :

CA-20/21 Series is a LCD digital display, Multi-San color monitor CRT use Hitachi brand CRT.

All Push-Button controllers in the front panel, Also with LCD indicator to show the monitor adjustment and display status.

II. Input Signal Specification:

1. Horizontal Input : TTL signal, input current ≧ 3mA,

   Frequency range a. CA-2011 30 Khz ~ 65 Khz.

   b. CA-2012 30 Khz ~ 82 Khz.

   c. CA-2111 30 Khz ~ 82 Khz.

2. Vertical Input : TTL signal, input current ≧ 3mA,

   Frequency range: 50Hz ~ 120Hz.

3. Sync Signal (TTL or H+V) input Voltage level 2.5Vpp ~ 5Vpp.

4. SOG (Sync on Green) Analog signal, input Voltage level 0.3Vpp.

5. Video input : Analog 0.7Vpp R.G.B.

   Band width a. 20" 100Mhz - 3db

   b. 21" 130Mhz - 3db

6. Ac Input Voltage : 110VAC ± 5% 240VAC ± 10%

   Voltage Frequency range 47Hz ~ 63Hz.

   Maximum current 4.0A.

7. Internal factory production line use ET-4000 VGA V2.0 for Adjustment and inspection.

3. VR101 : For High Voltage adjustment.

   Adjust VR101 use 31K 640x480 crosshatch pattern ,to get TP3 output is 55.5V±0.3V.

4. VR201 : For Horizontal B+ adjustment.

   Adjust VR201 to TP2 output Voltage is 78.5V±0.3V at external adjust to maximum of Horizontal width.

5. VR301 : For Horizontal hold adjustment.

   Adjust VR301 to get U301 Pin28 (TP4)output frequency is 74.7Khz± 100Hz use 75Khz 1280x1024 crosshatch pattern and CN301 grounded.

6. VR302 : For Horizontal F to V adjustment.

   Adjust VR302 to get U302 PIN13(CN302) output Voltage is 10V±0.1V use 57Khz 1024x768 crosshatch pattern.

7. VR103 : For Horizontal center adjustment.

   Adjust VR103 to get raster at center position use 57Khz 1024x768 crosshatch pattern.

8. VR102 : For side-pin center adjustment .

   Use 48Khz 1024x768 crosshatch pattern.

9. VR104 : For Squarely adjustment .

   Use 48Khz 1024x768 crosshatch pattern.

10. VR105 : For Parallelogram adjustment. adjustment .

    Use 48Khz 1024x768 crosshatch pattern.

III. Switching mode Power Supply output :

1. D521 : B+ 210V±0.3V 0.3A for Higth Voltage and Horizontal circuit DC-Detector.
2. D527 : 110V±0.3V 0.15A for Video Driver output.
3. D518 : 24V±0.3V 0.5A for Vertical circuit and Horizontal Driver.
4. D517 : 15V±0.1V 0.4A for Linearity IC.
5. D516 : 15V±0.1V 0.2A for BNC Board and Video Board.
6. D515 : 7V±0.1V 0.7A for Logic Board.
7. Q503 : 7V±0.1V 0.6A for Heater.

IV. Test Equipment and Tools

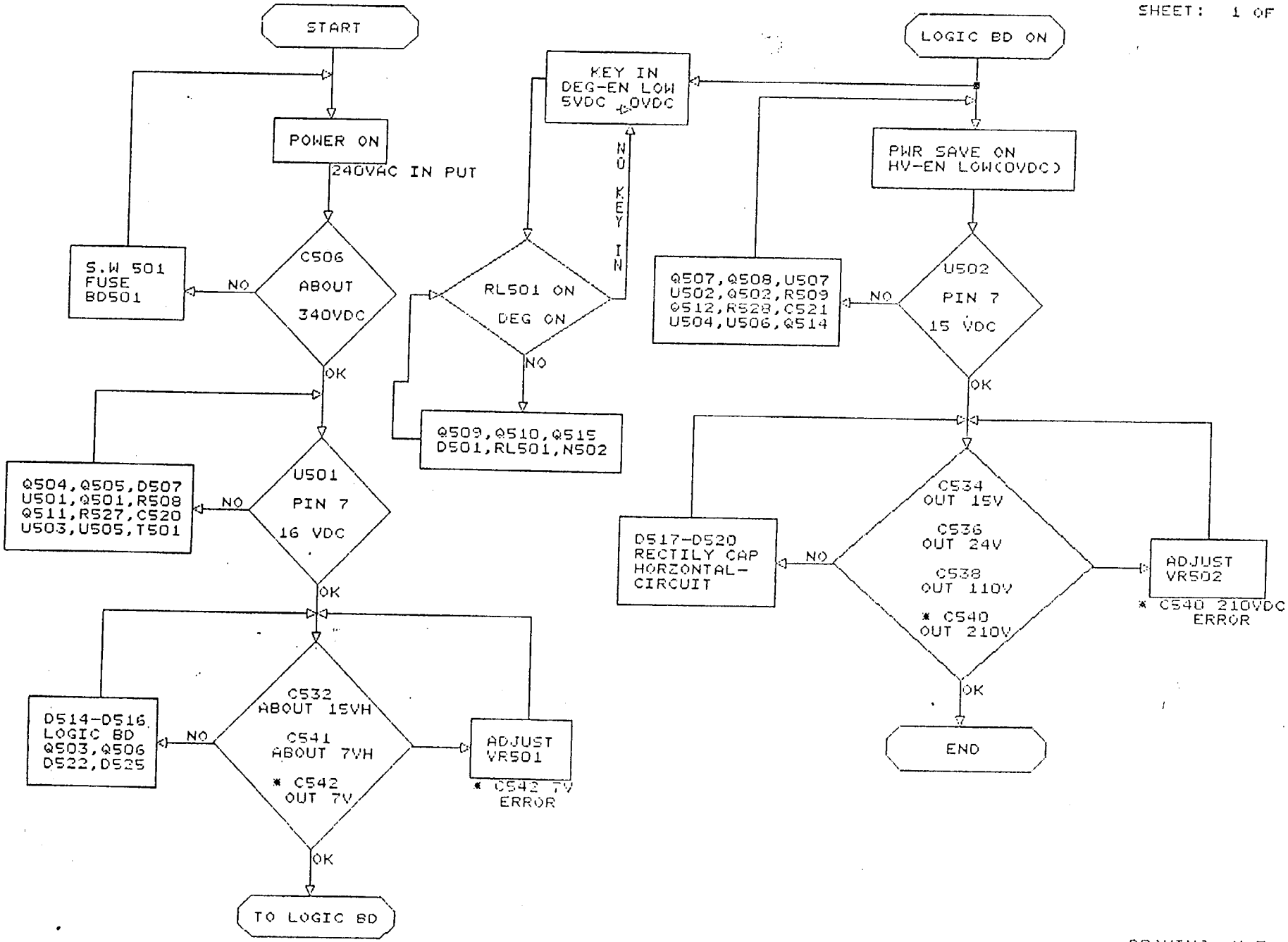
1. IBM compatible personal computer one unit.
   (Including ET-4000 VGA card revision 2.0)
2. Digital type Voltage meter.
3. Oscilloscope and Prob (100: 1)
4. TV-Color analyzer.
5. Degauss
6. Insulation stick with " - " Driver on Tip.

V. Interior VR Function:

1. VR501 : For Power 7VDC adjustment.
   Adjust VR501 to get Q503 output is 7VDC ±.0.3V.
2. VR102 : For Power 210VDC adjustment.
   Adjust VR501 to get D521 output is 210VDC ±.0.3V.

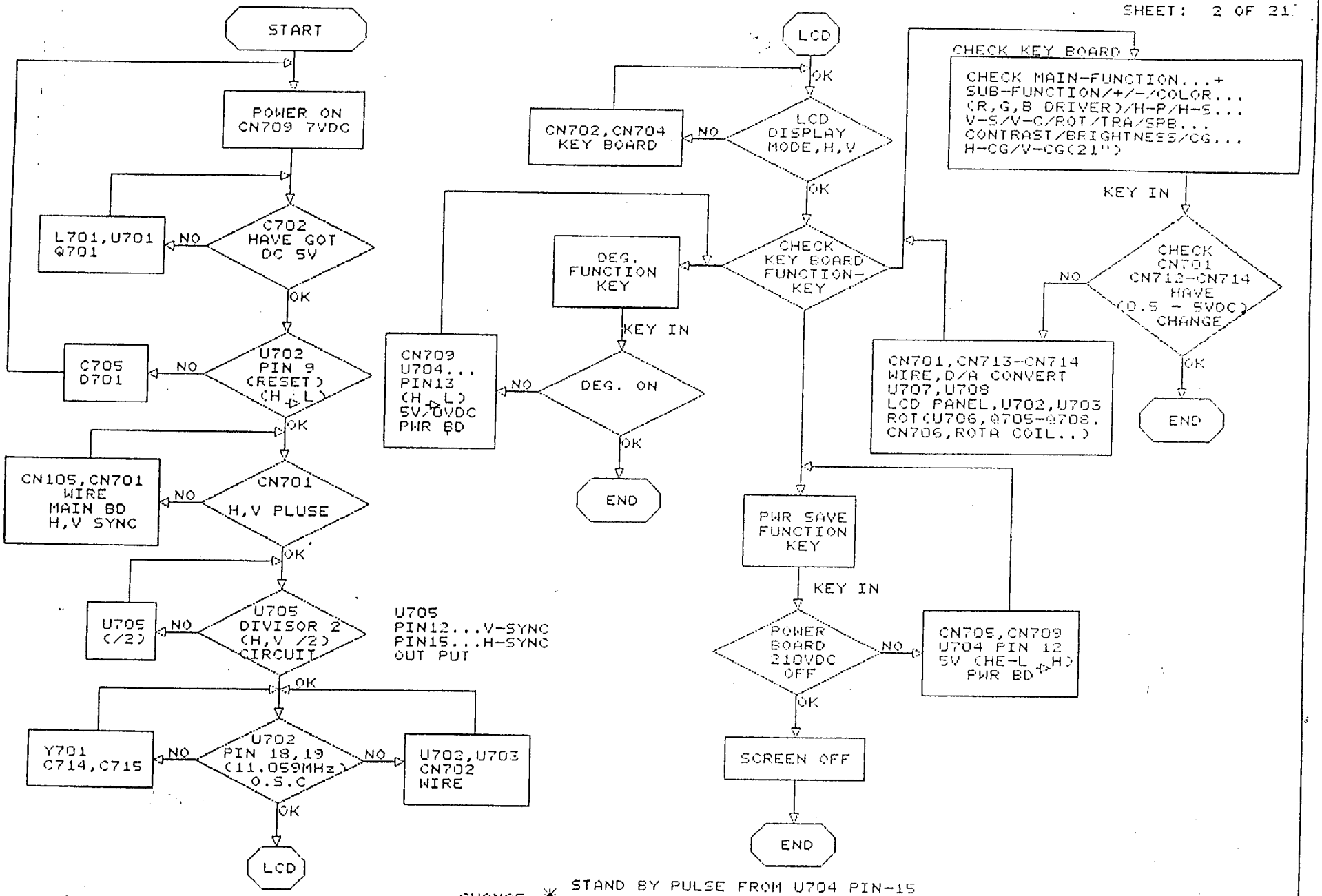
MC-Service

CA-2011/CA-2111 POWER CIRCUIT FLOW CHART

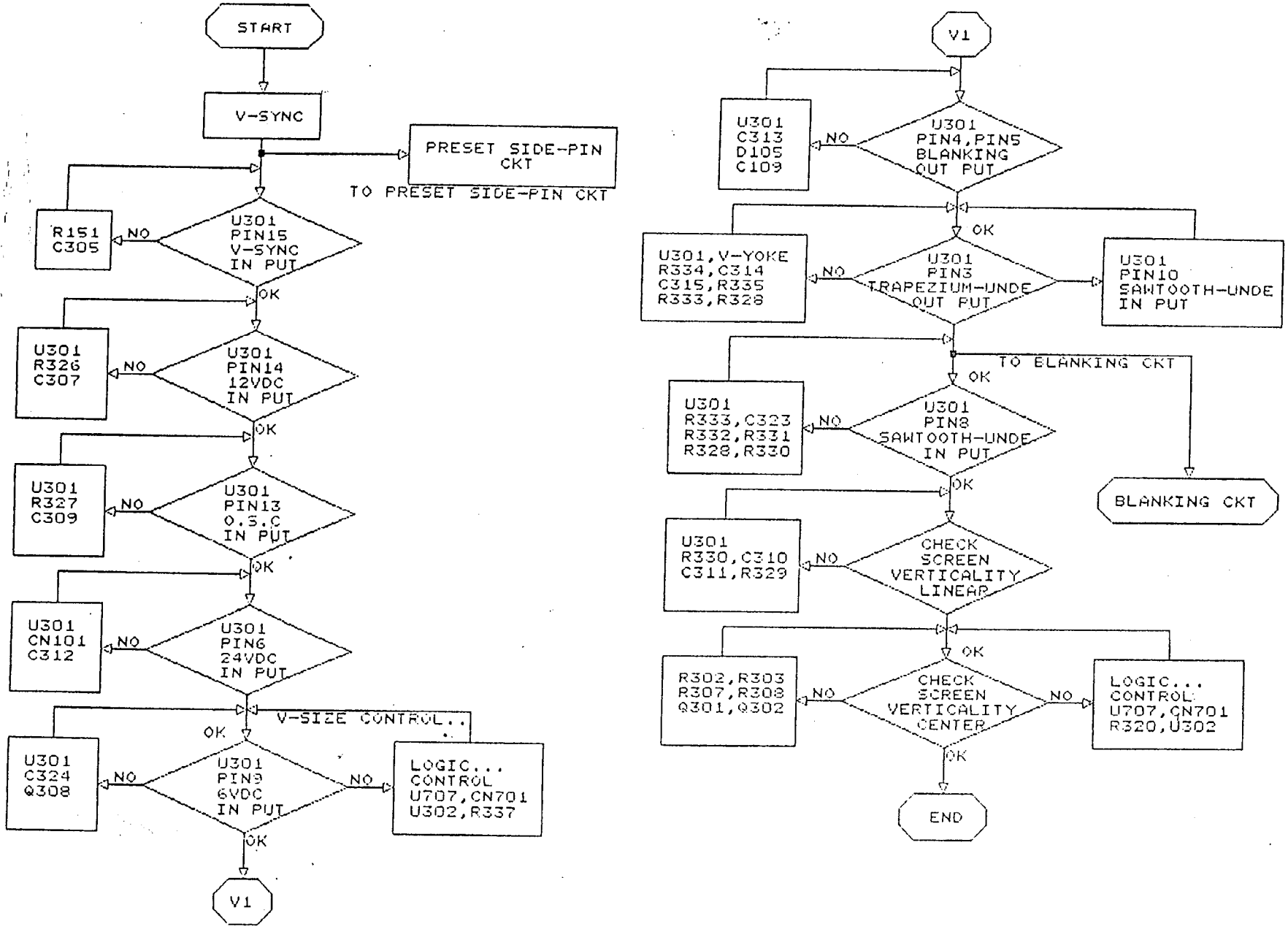


DRAWING (N.E

CA-2011/CA-2111 LOGIC BOARD & KEY BOARD FLOW CHART



CA-2011/CA-2111 VERTICALITY CIRCUIT FLOW CHART



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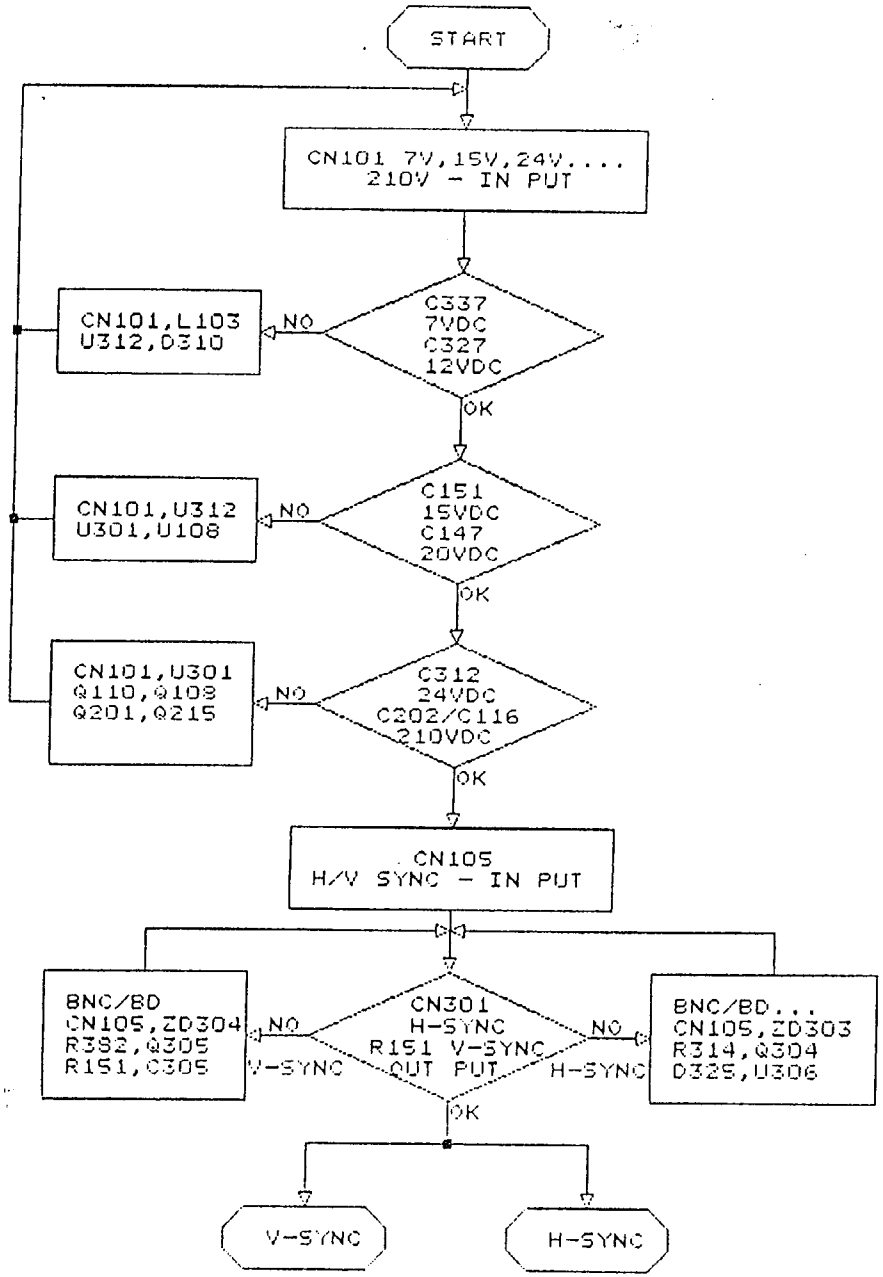
CA-2011/CA-2111 MAIN BD CIRCUIT FLOW CHART



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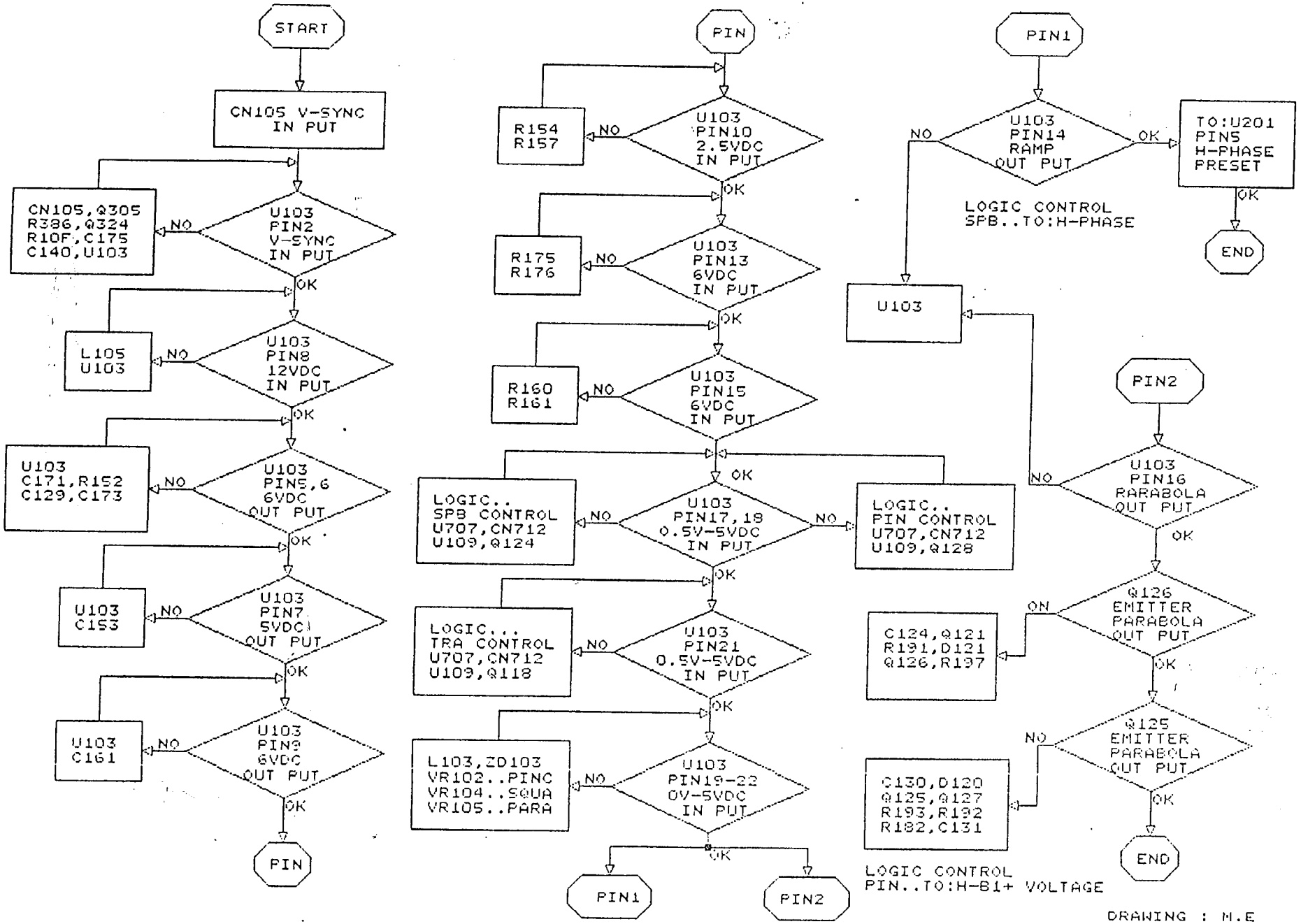

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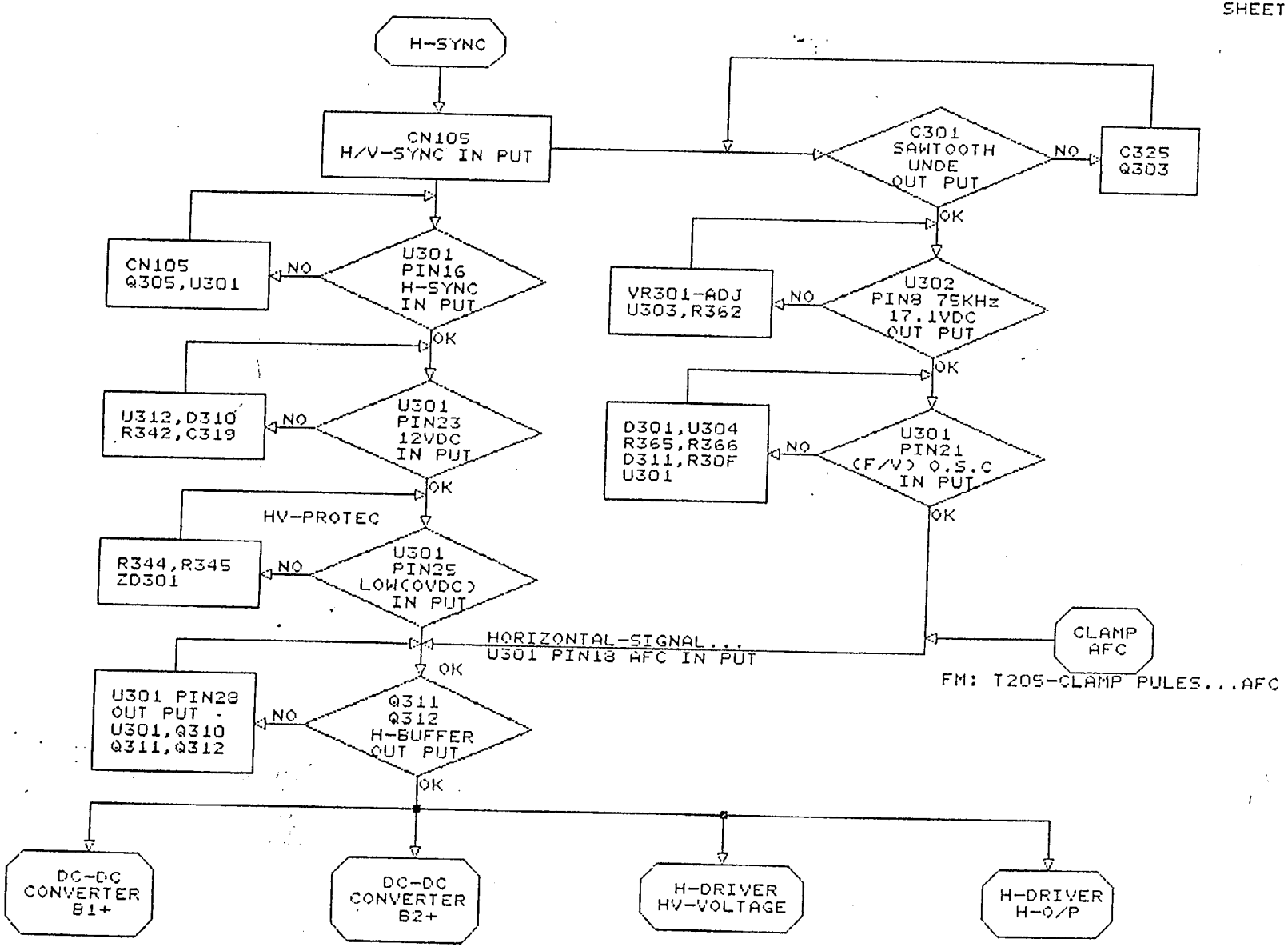
CA-2011/CA-2111 H-O.S.C CIRCUIT FLOW CHART



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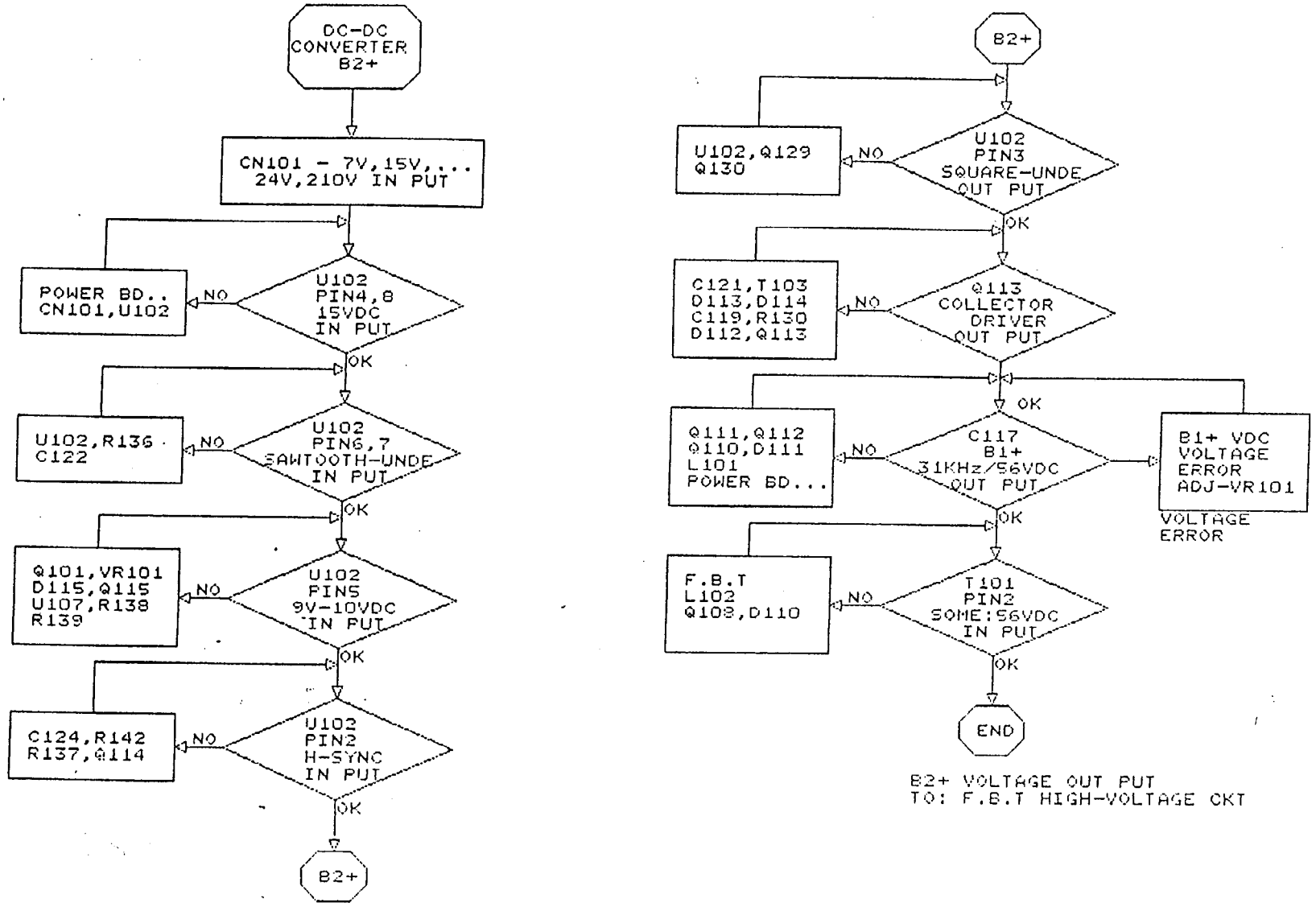
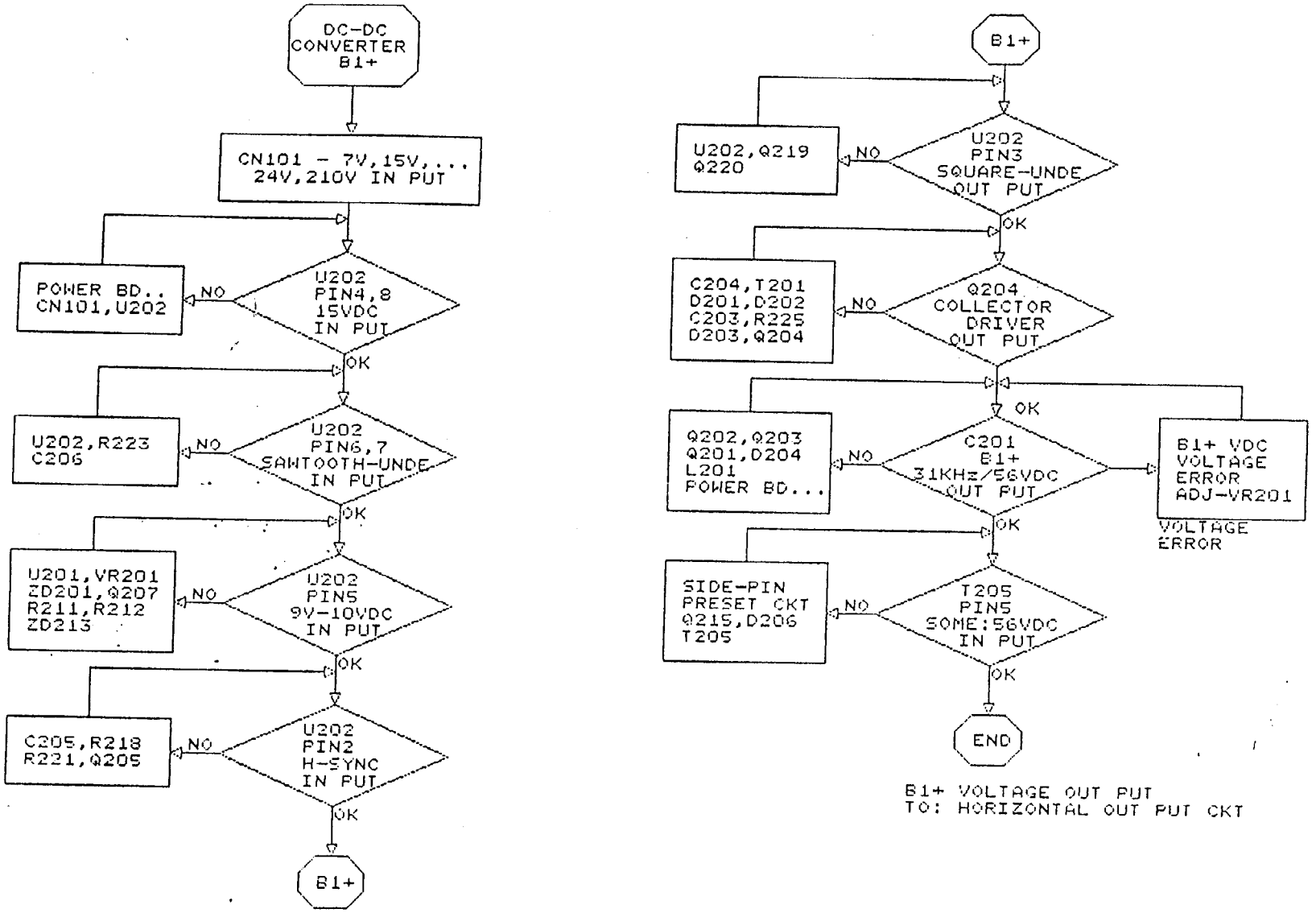
CA-2011/CA-2111 DC-DC CONVERTER B2+ CIRCUIT FLOW CHART



B2+ VOLTAGE OUT PUT
TO: F.B.T HIGH-VOLTAGE CKT

DRAWING : M.E

CA-2011/CA-2111 DC-DC CONVERTER B1+ CIRCUIT FLOW CHART



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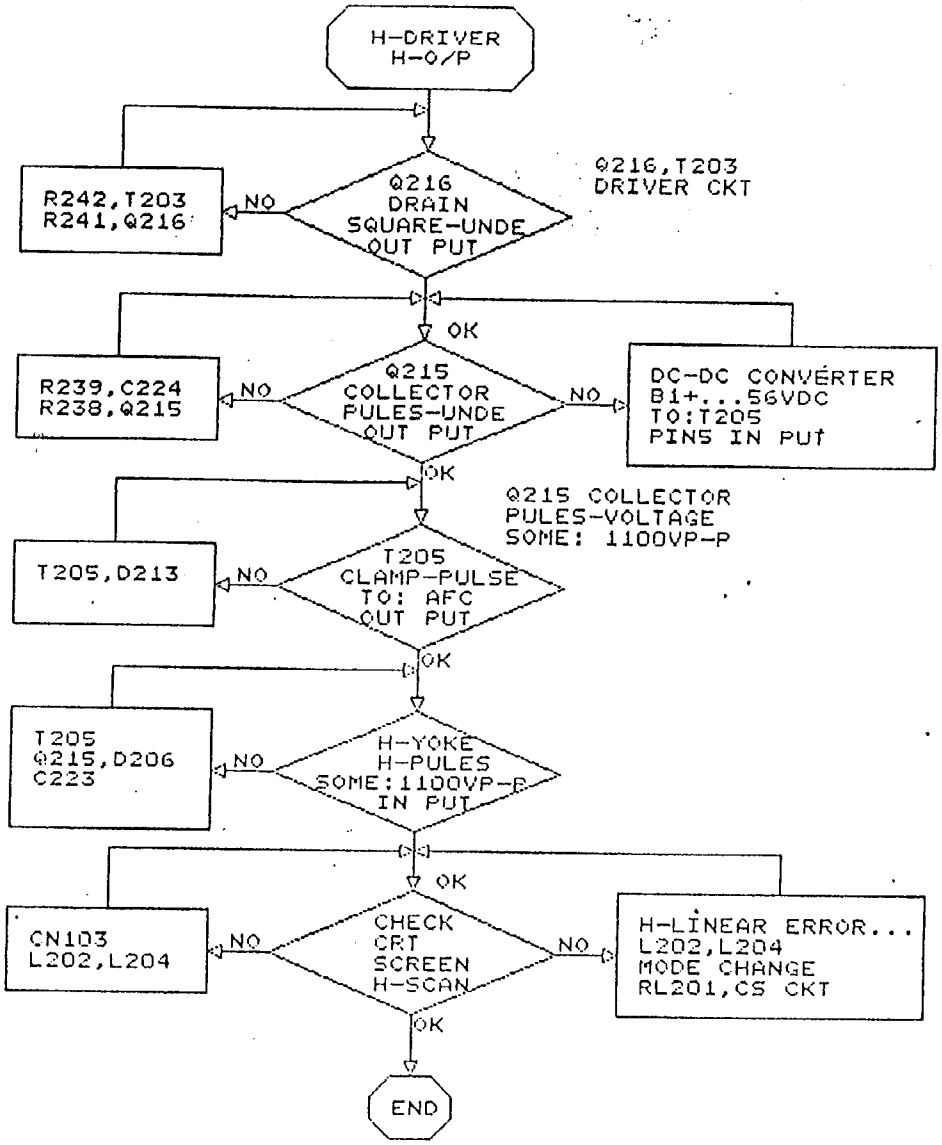

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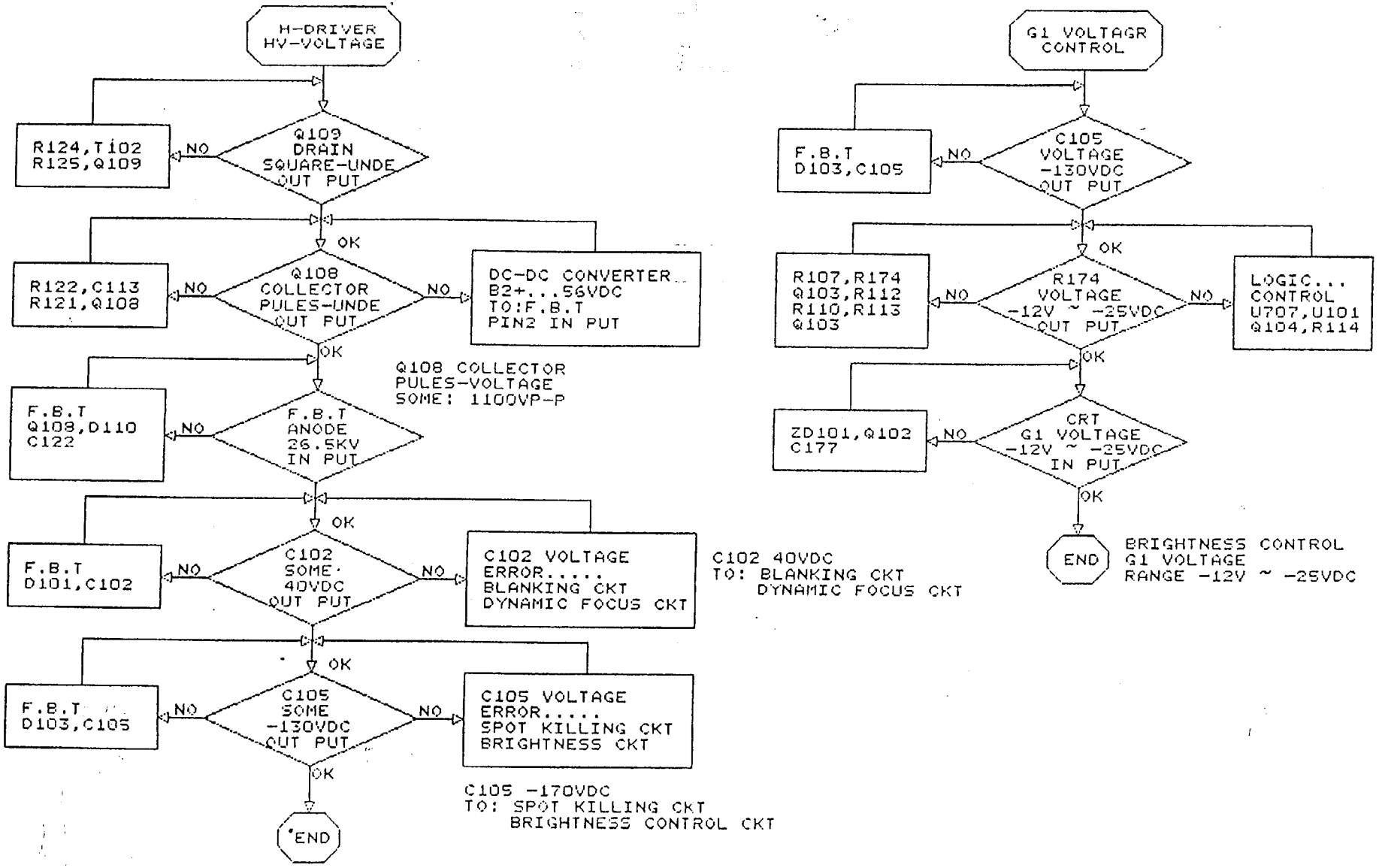

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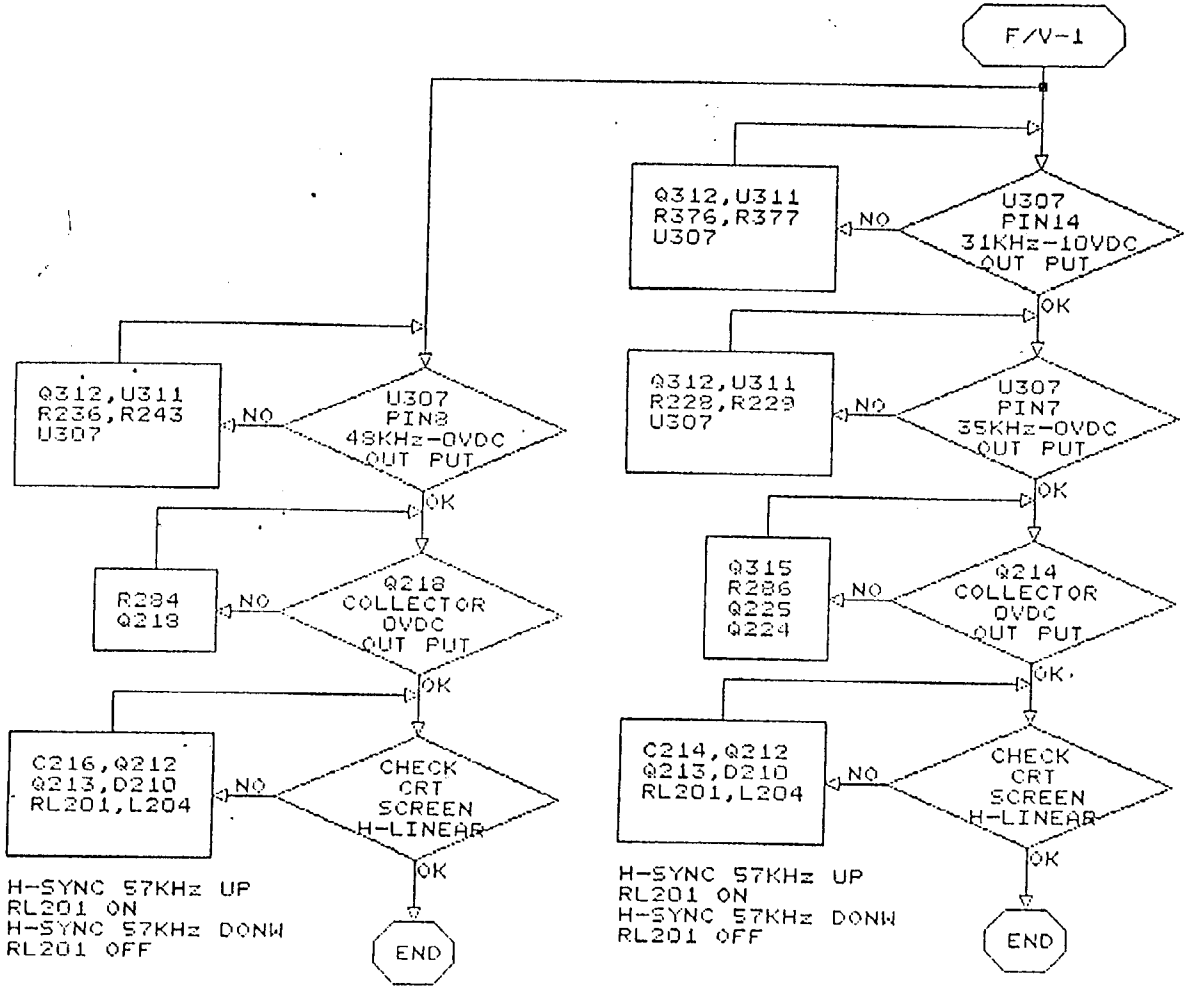
CA-2011/CA-2111 F/V MODE CHANGE CS CIRCUIT FLOW CHART



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CA-2011/CA-2111 F/V MODE CHANGE CS CIRCUIT FLOW CHART

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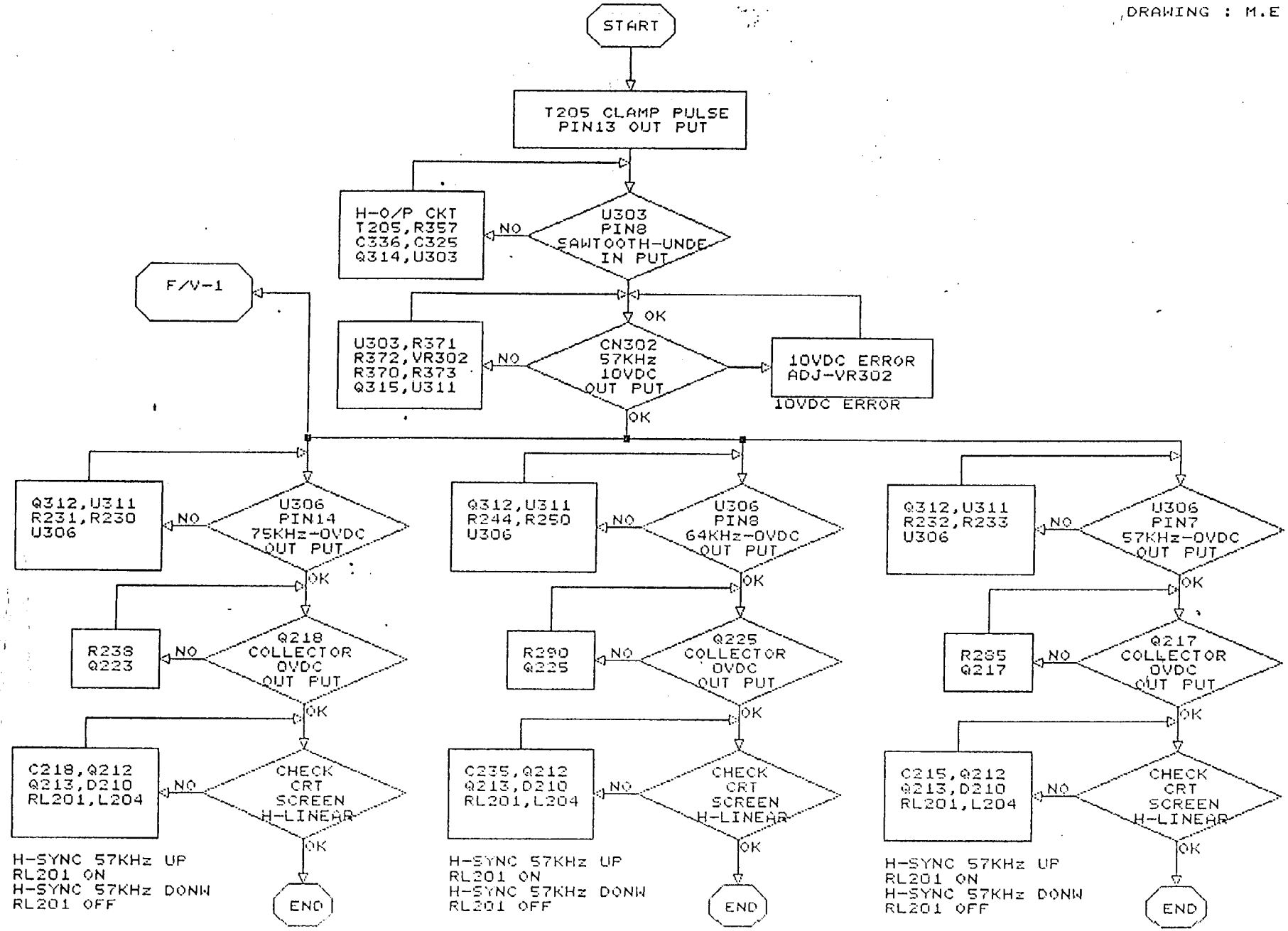
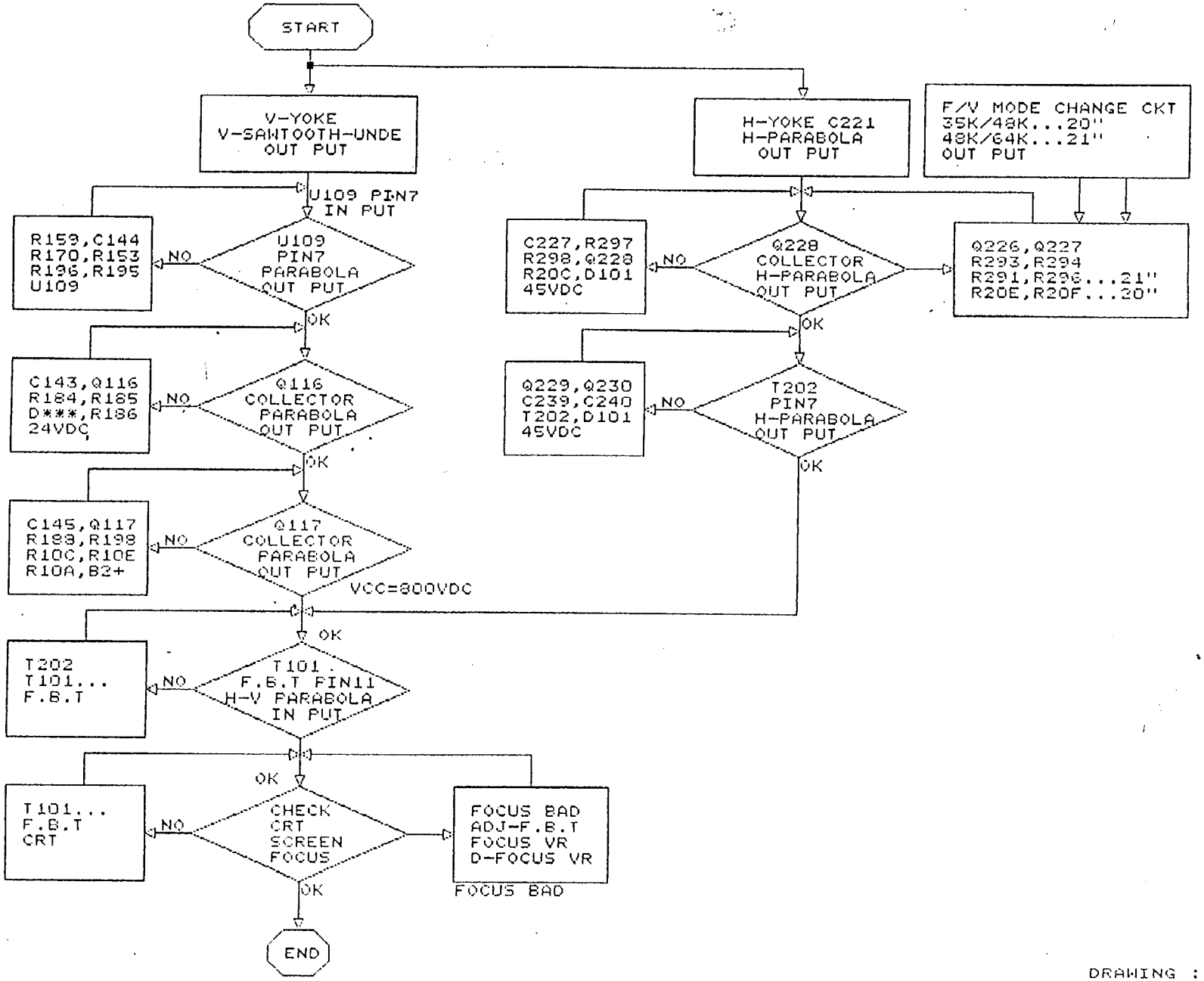


CA-2011/CA-2111 DYNAMIC FOCUS CIRCUIT FLOW CHART



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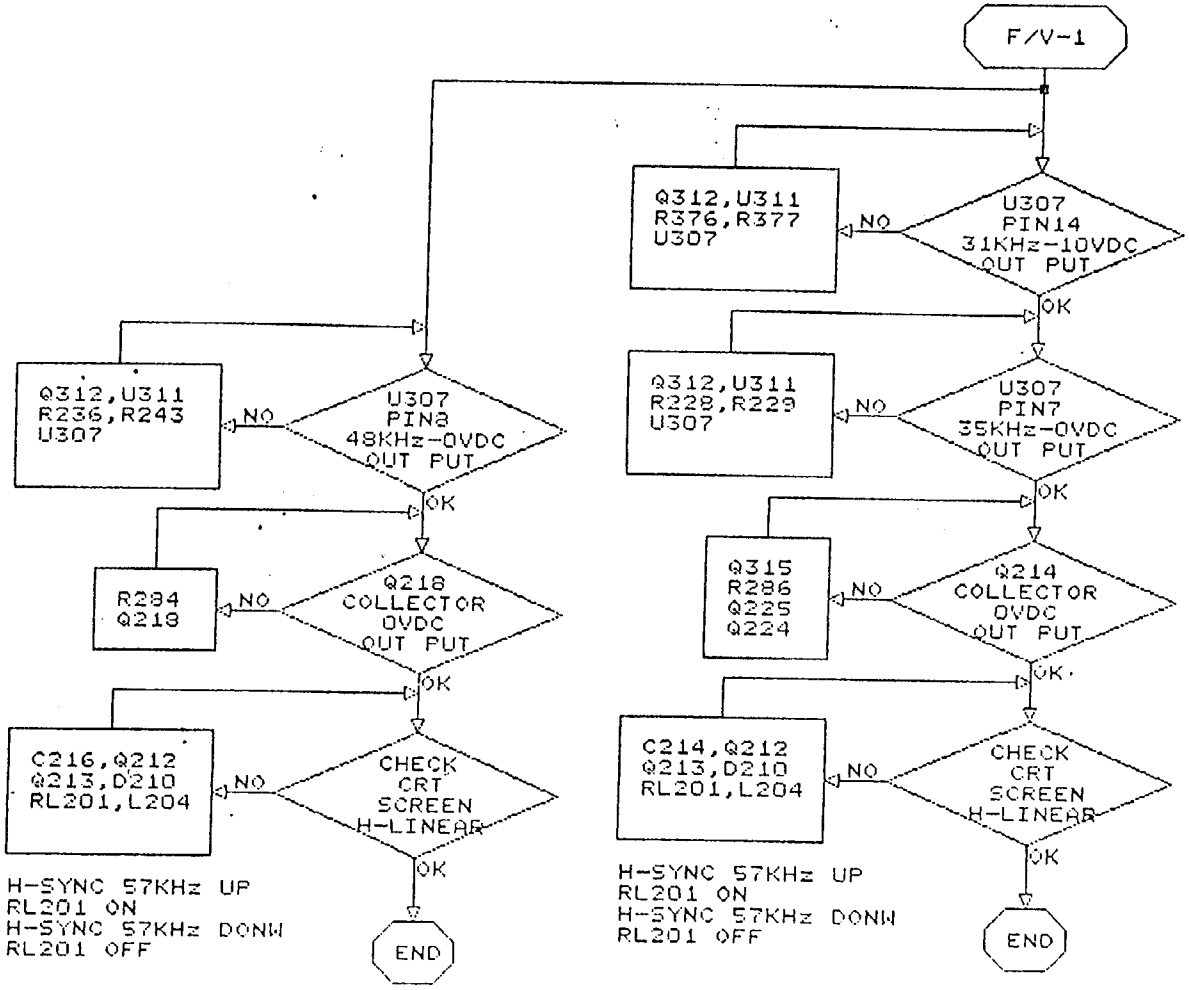
CA-2011/CA-2111 F/V MODE CHANGE CS CIRCUIT FLOW CHART



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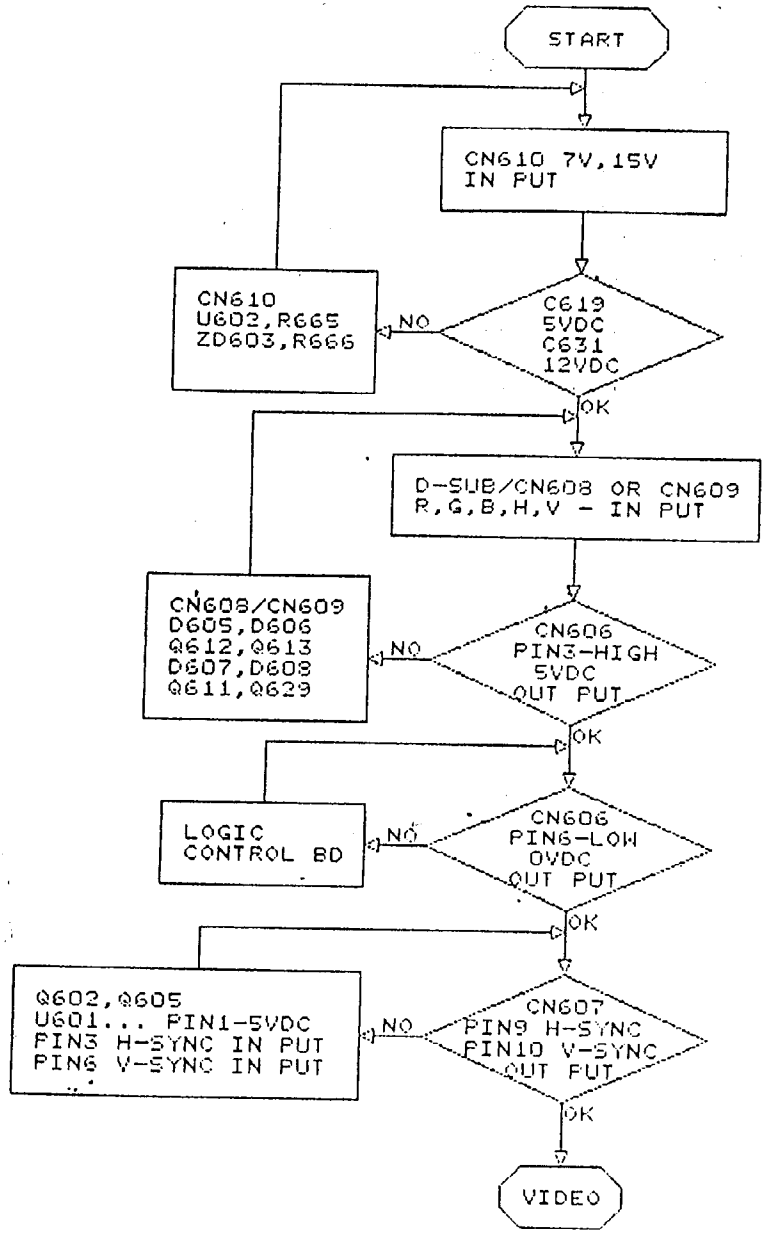
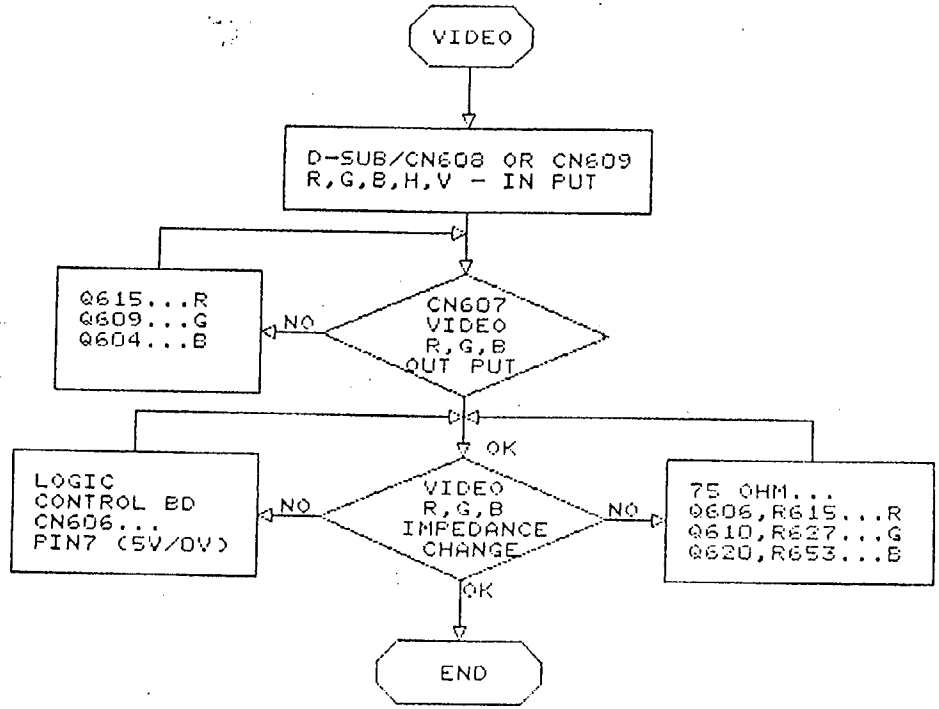
CA-2011 BNC/D-SUB CIRCUIT FLOW CHART





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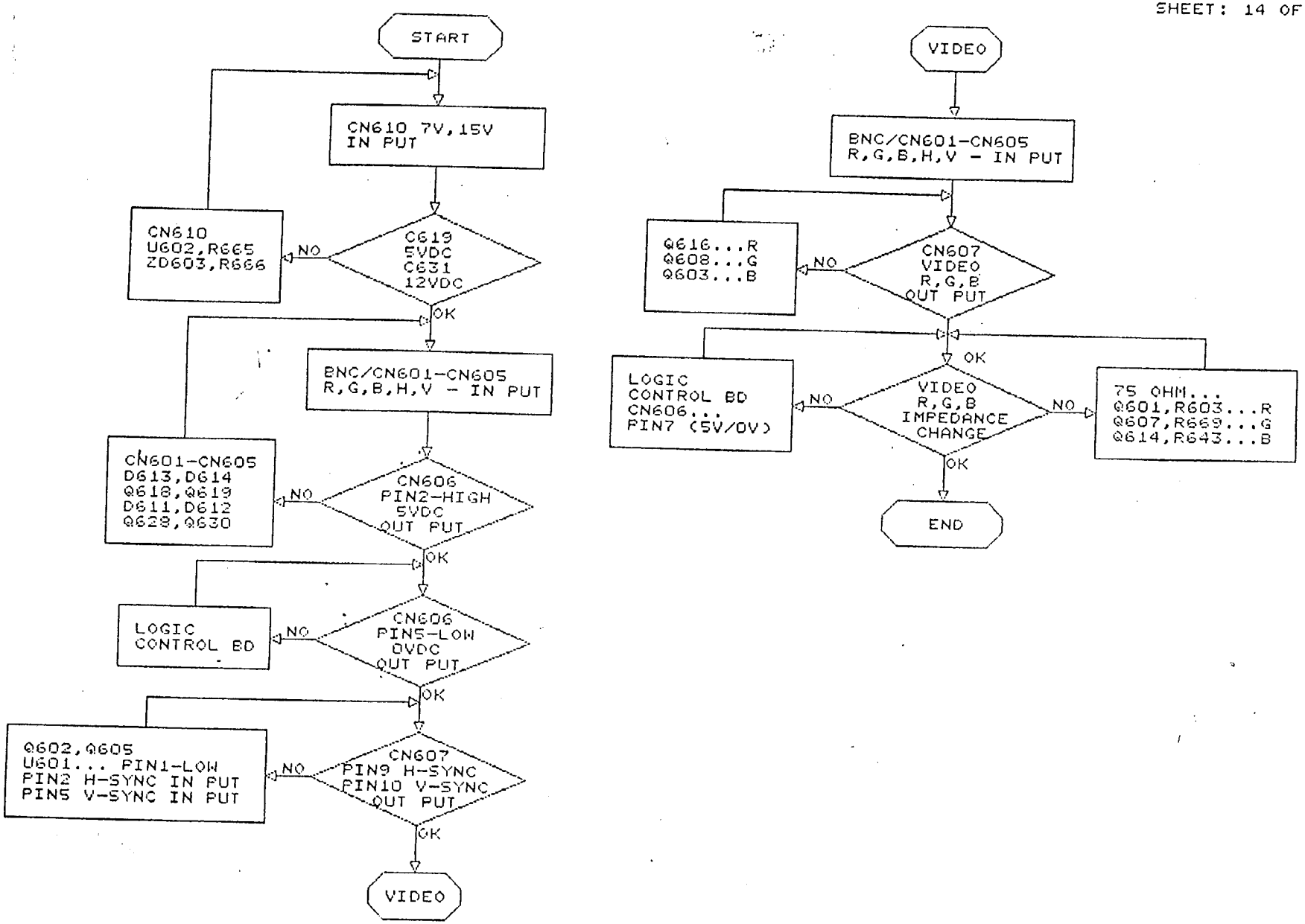

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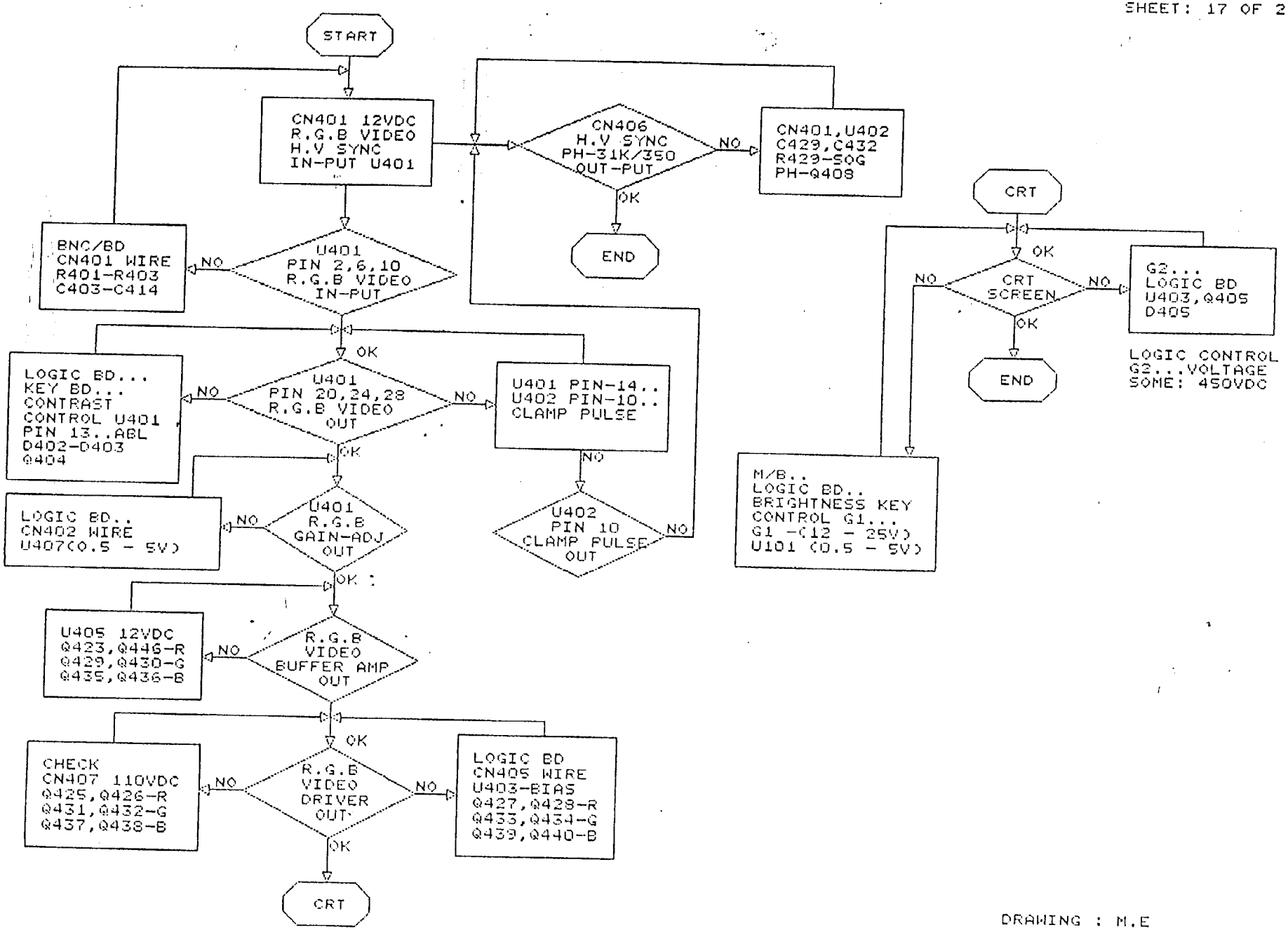
CA-2011 CRT CIRCUIT FLOW CHART



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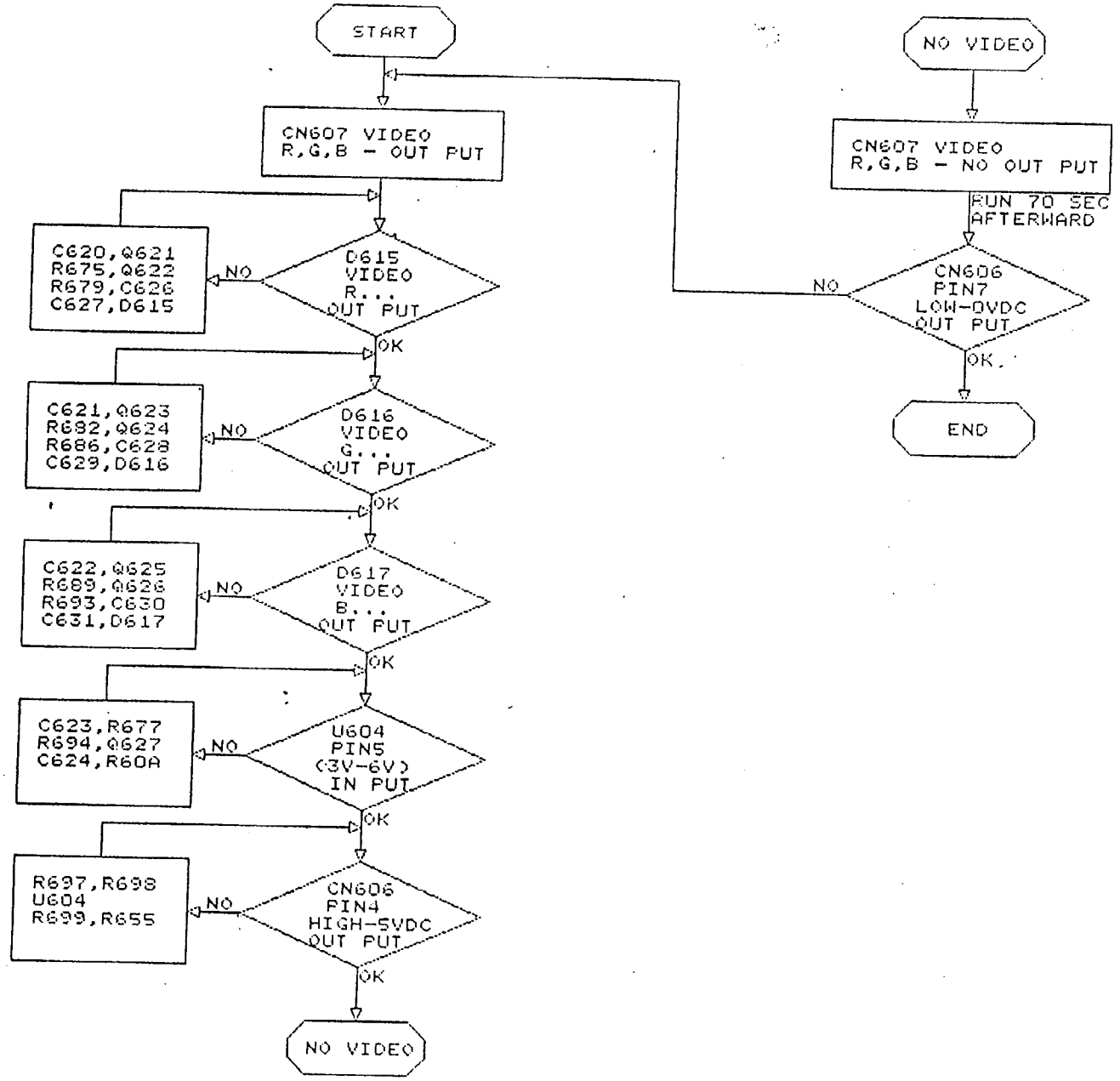
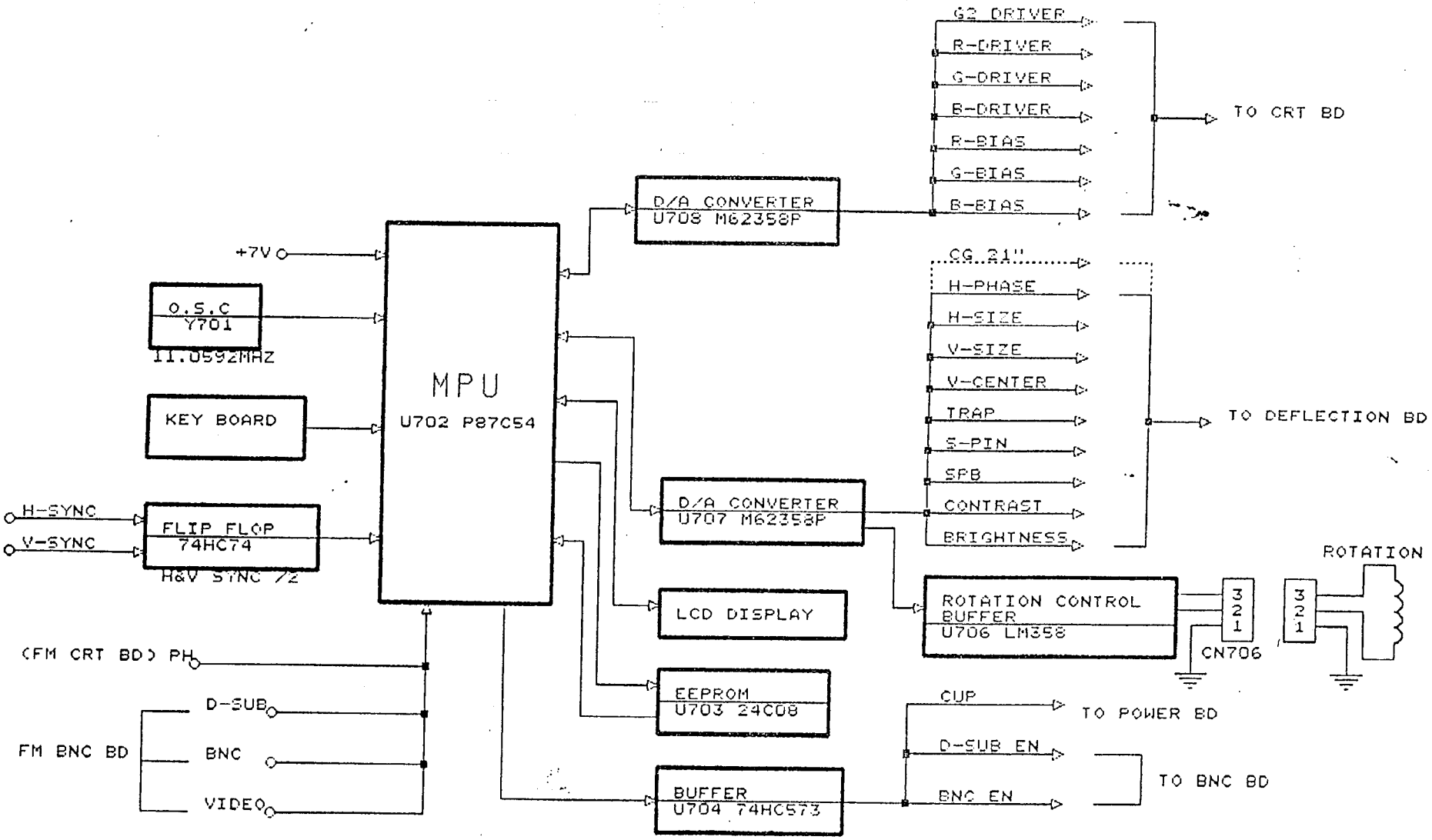
CA-2011 BNC/PWR SAVING CIRCUIT FLOW CHART

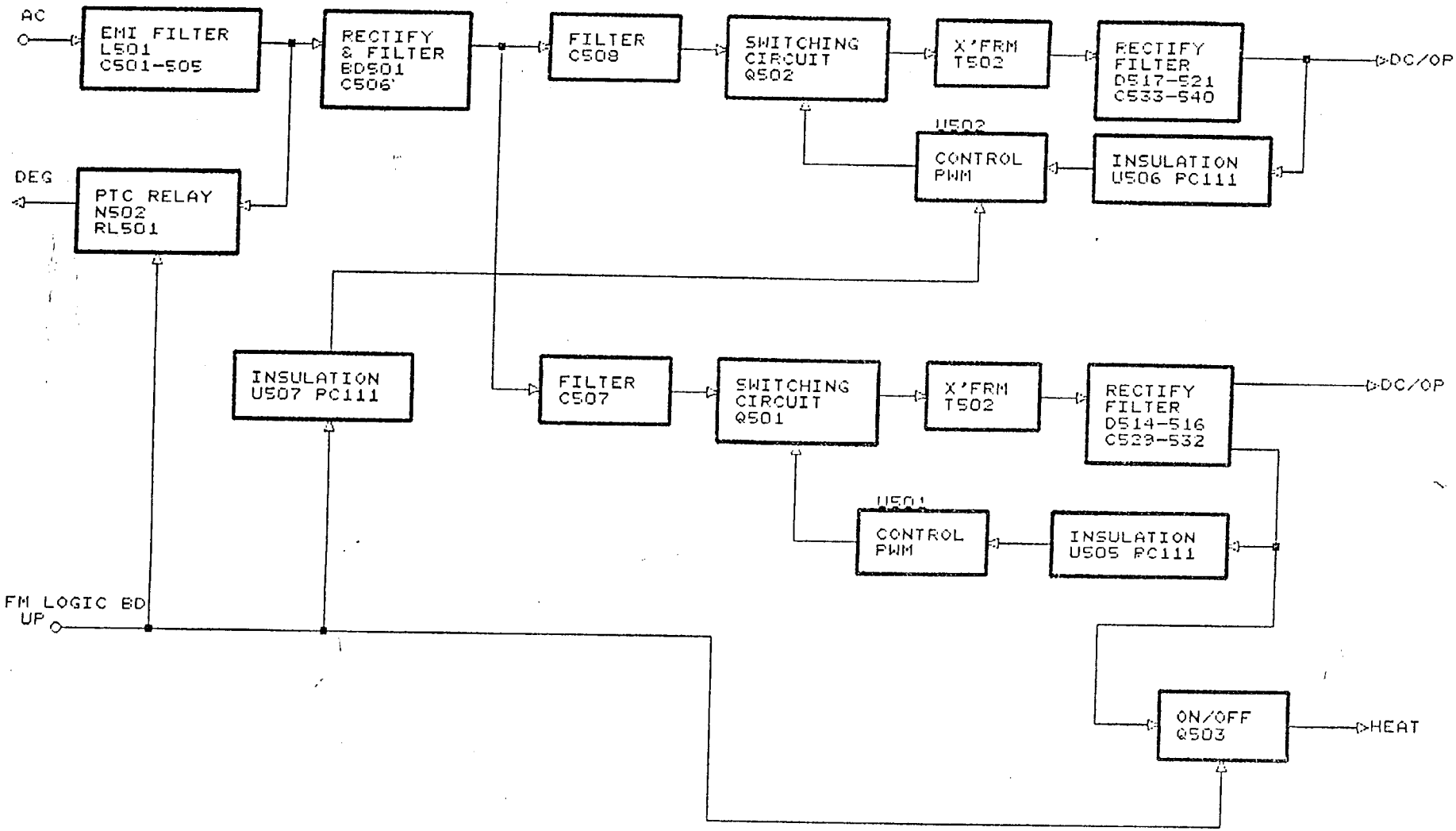


DRAWING : M.E

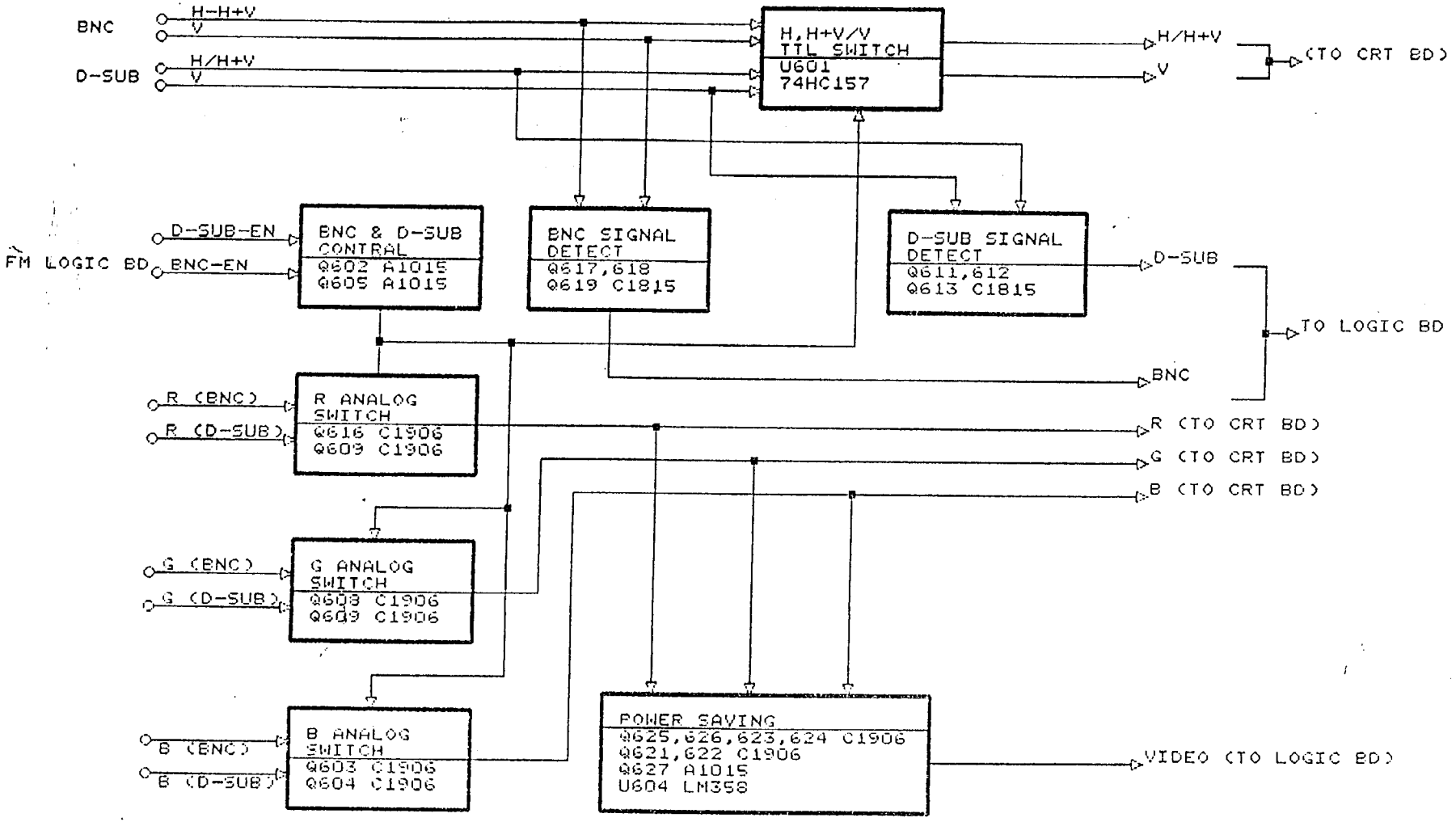
CA-2011/CA-2111 LOGIC CONTROL BLOCK DIAGRAM



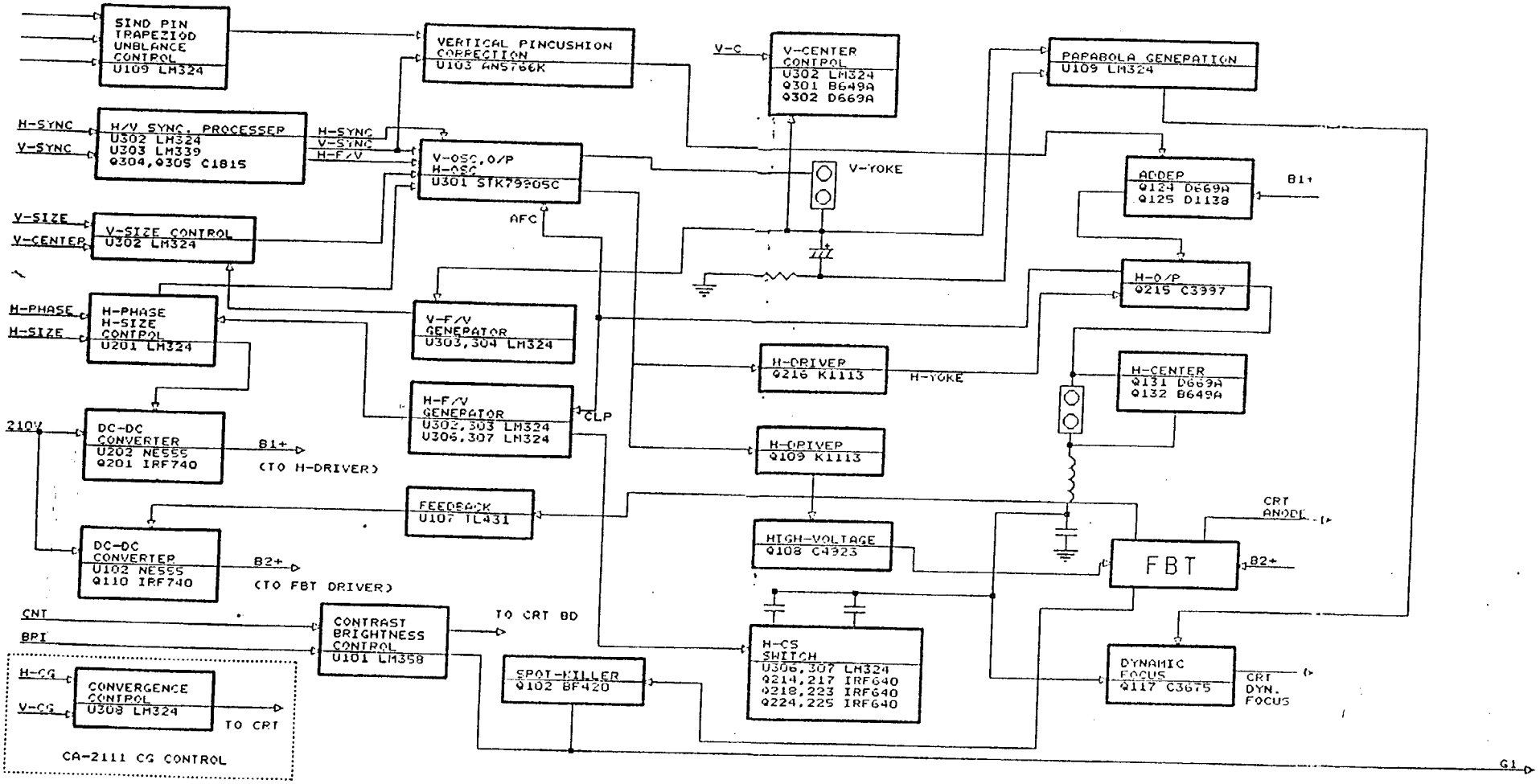
CA-2011/CA-2111 POWER BD BLOCK DIAGRAM



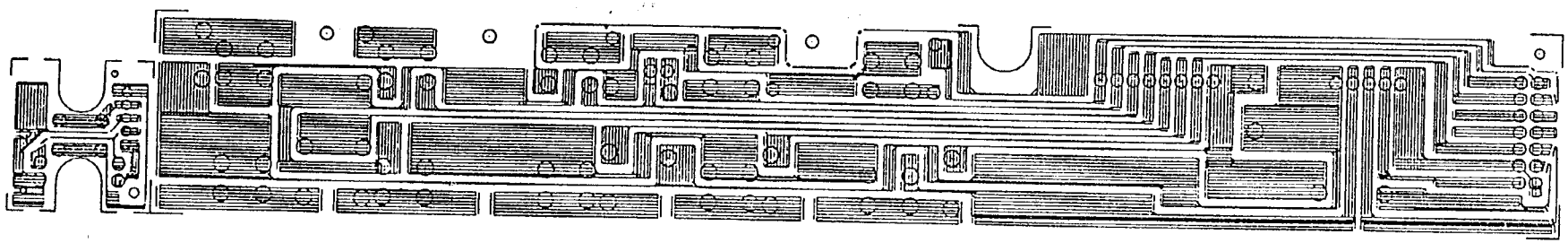
CA-2011 BNC BD BLOCK DIAGRAM



CA-2011/CA-2111 DEFLECTION BD BLOCK DIAGRAM

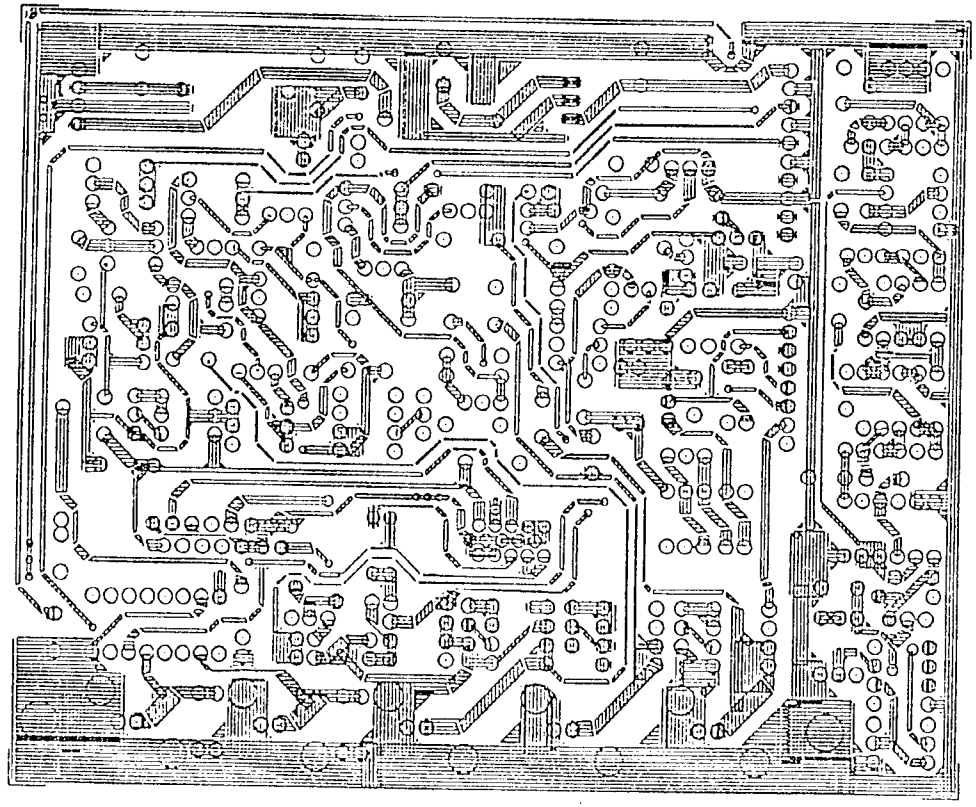


CA-2011 BNC BD & KEY BD

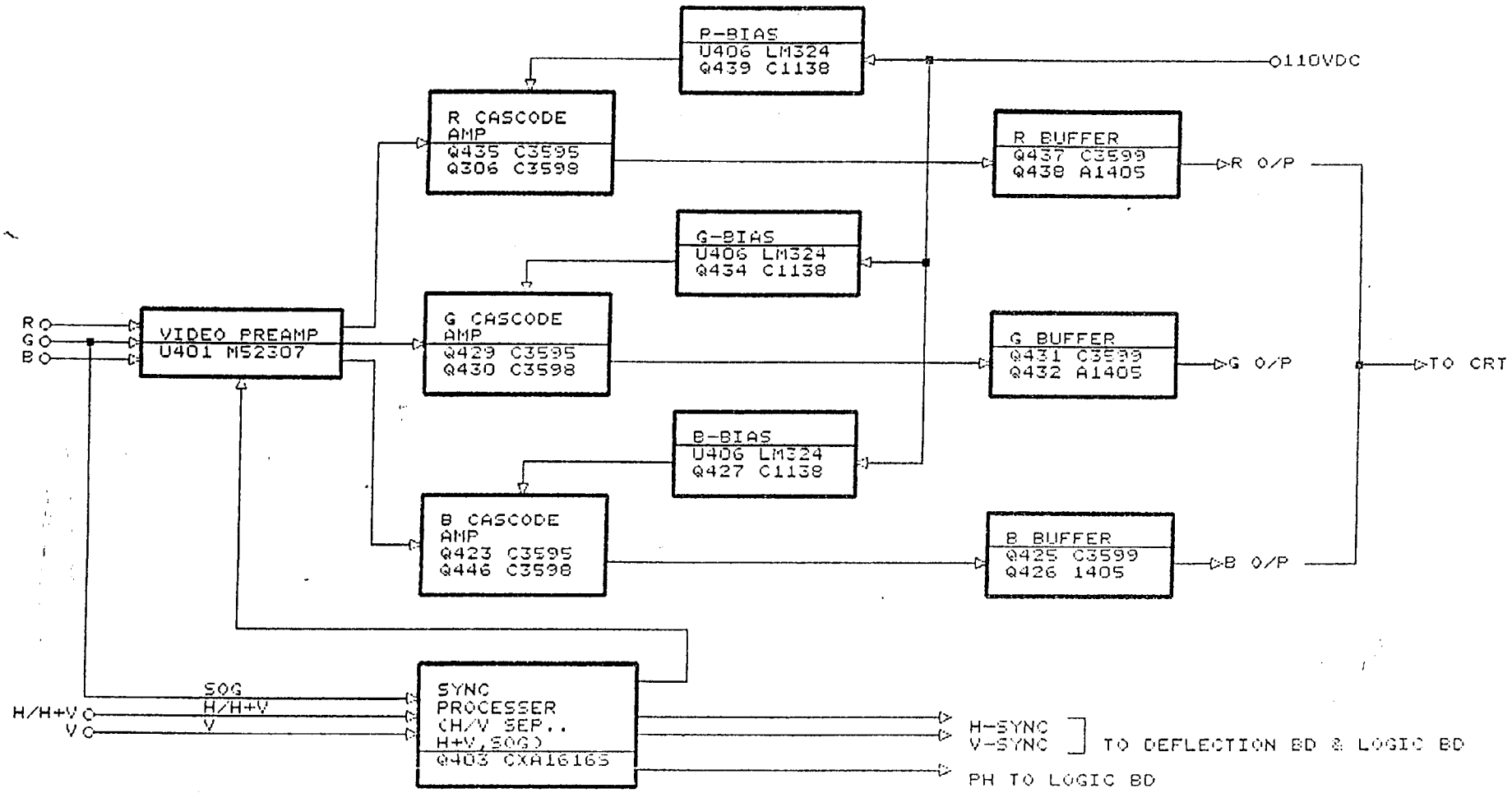


BNC BD

Tracer on Solder side



CA-2011 CRT BD BLOCK DIAGRAM



CA-2011 POWER BD BLOCK DIAGRAM

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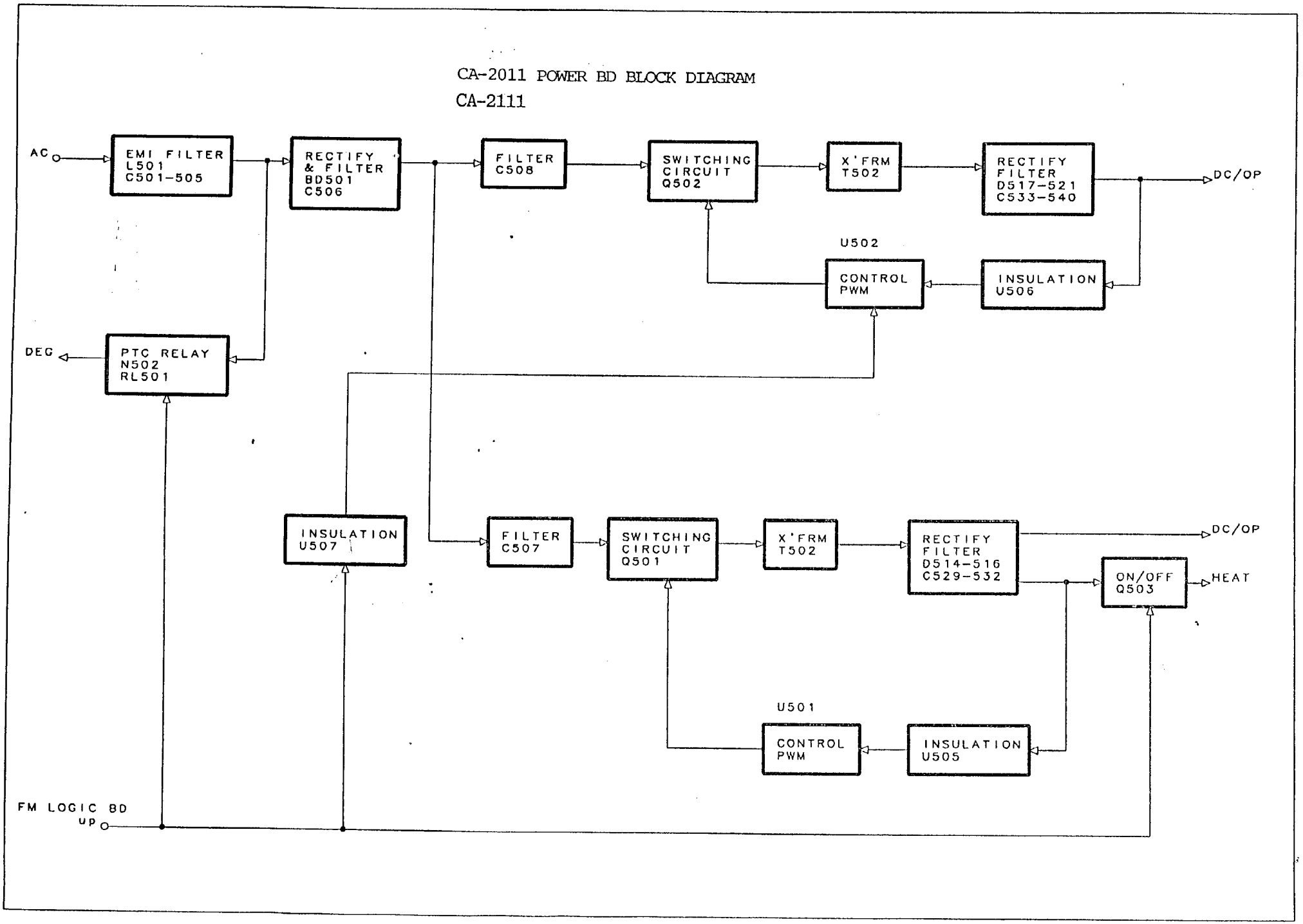
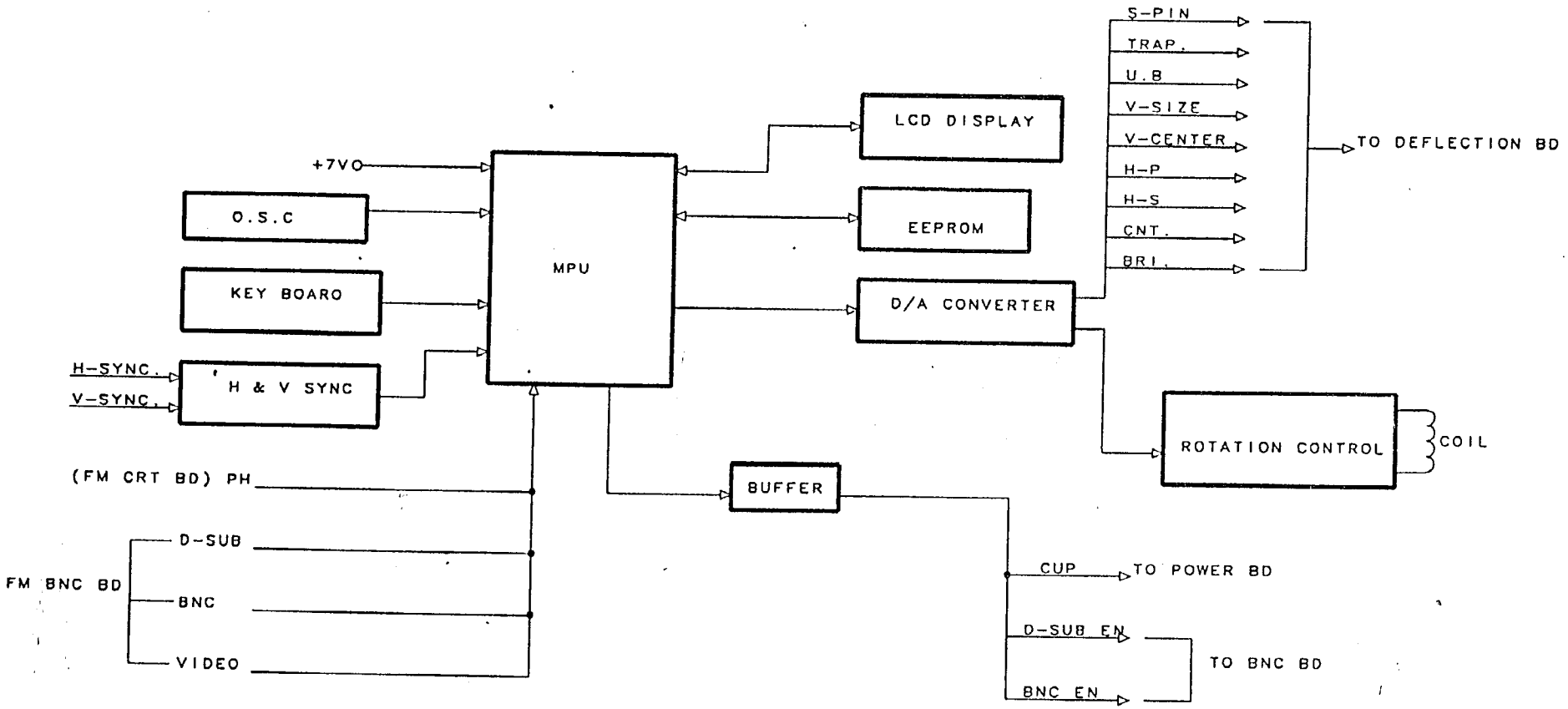
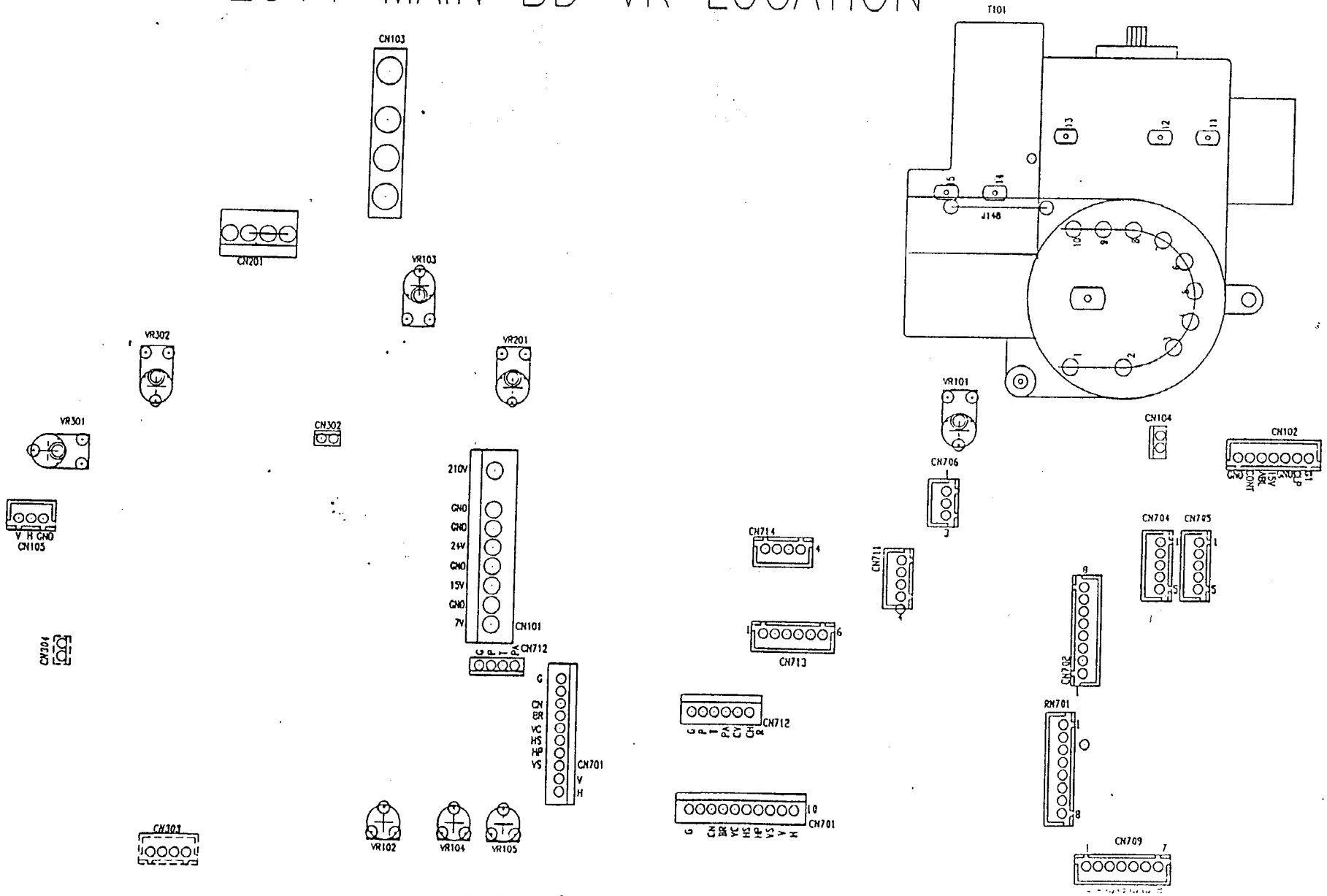
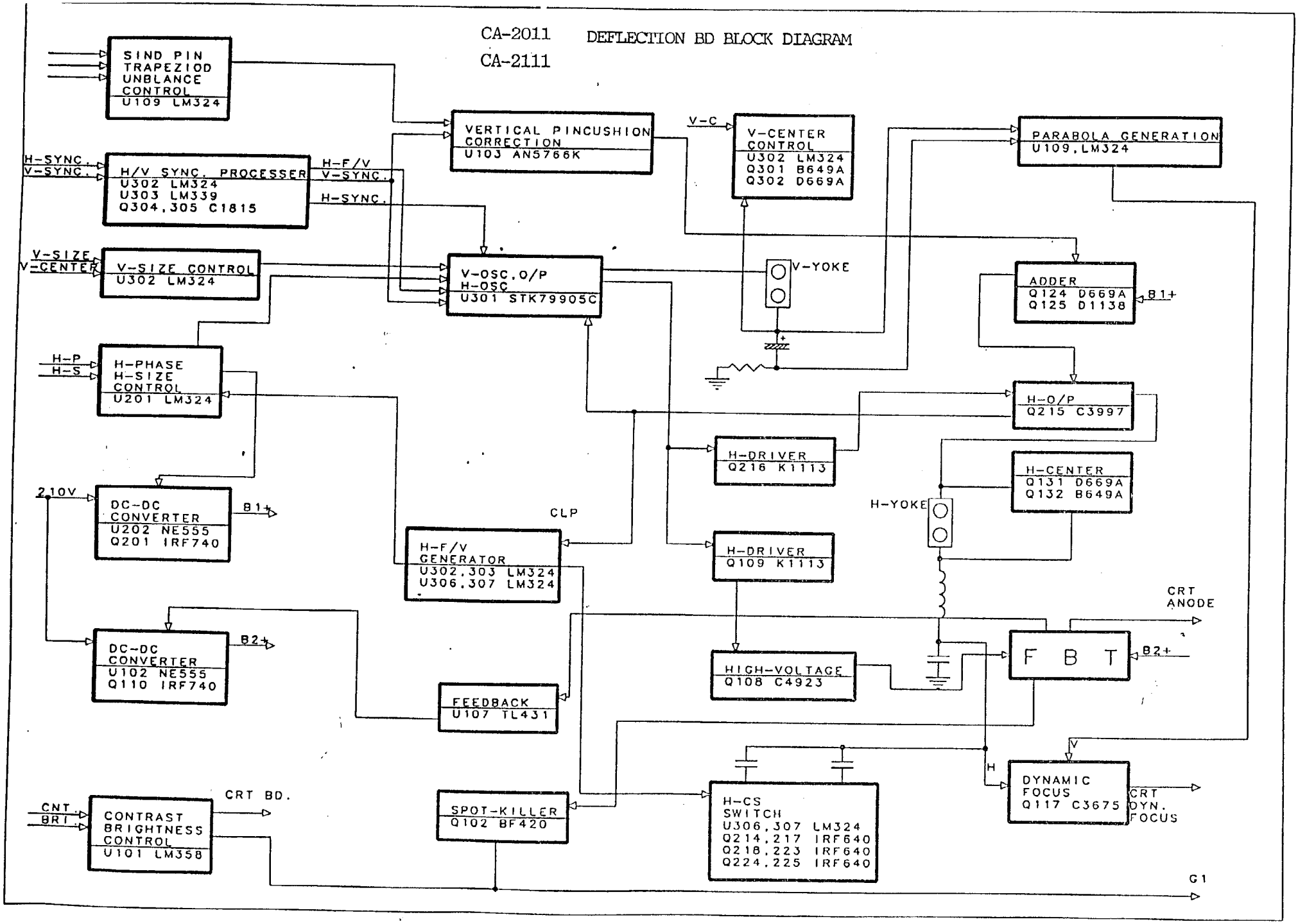


CA-2011 LOGIC BD BLOCK DIAGRAM
CA-2111

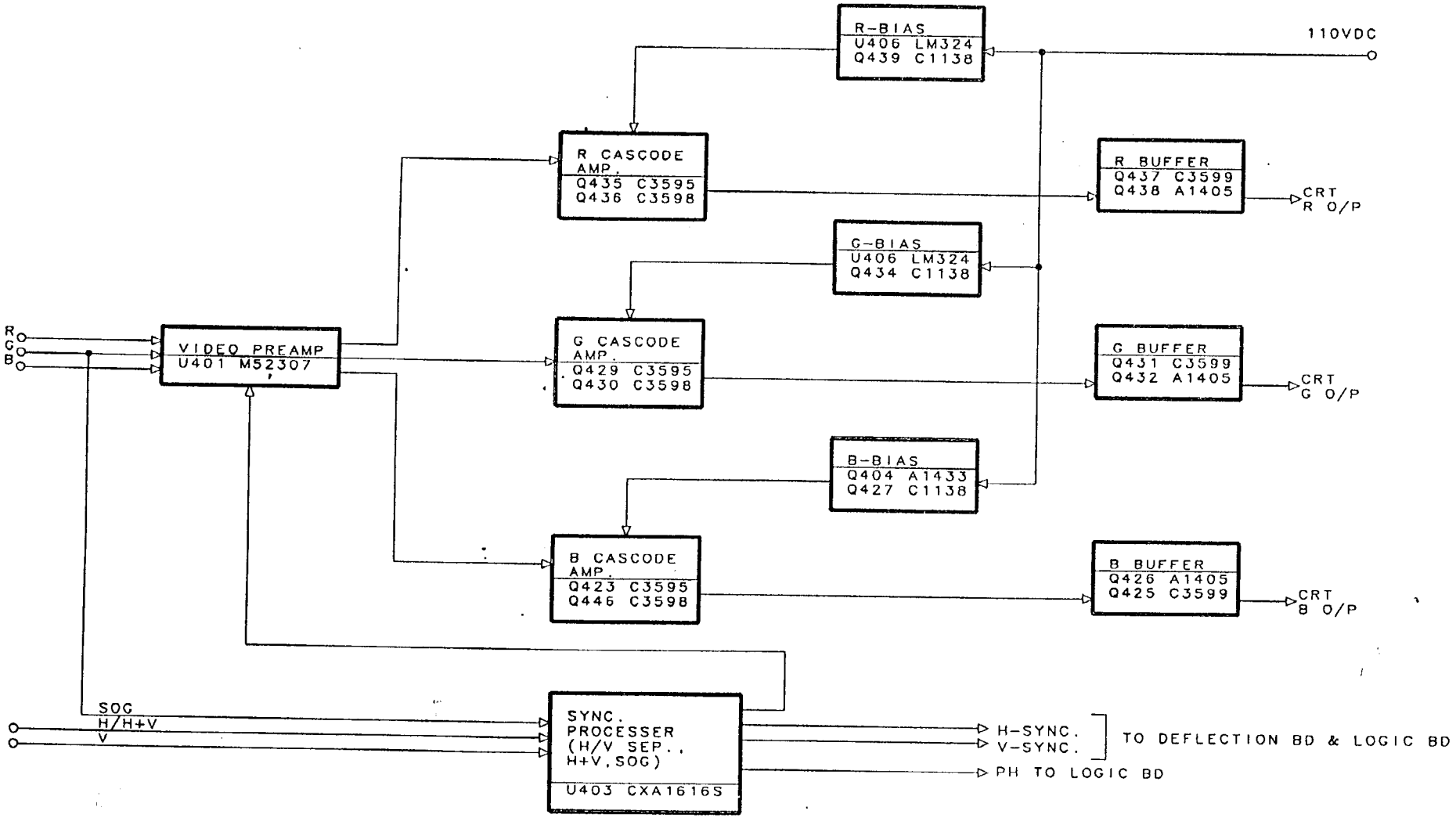


CA-2011 MAIN BD VR LOCATION

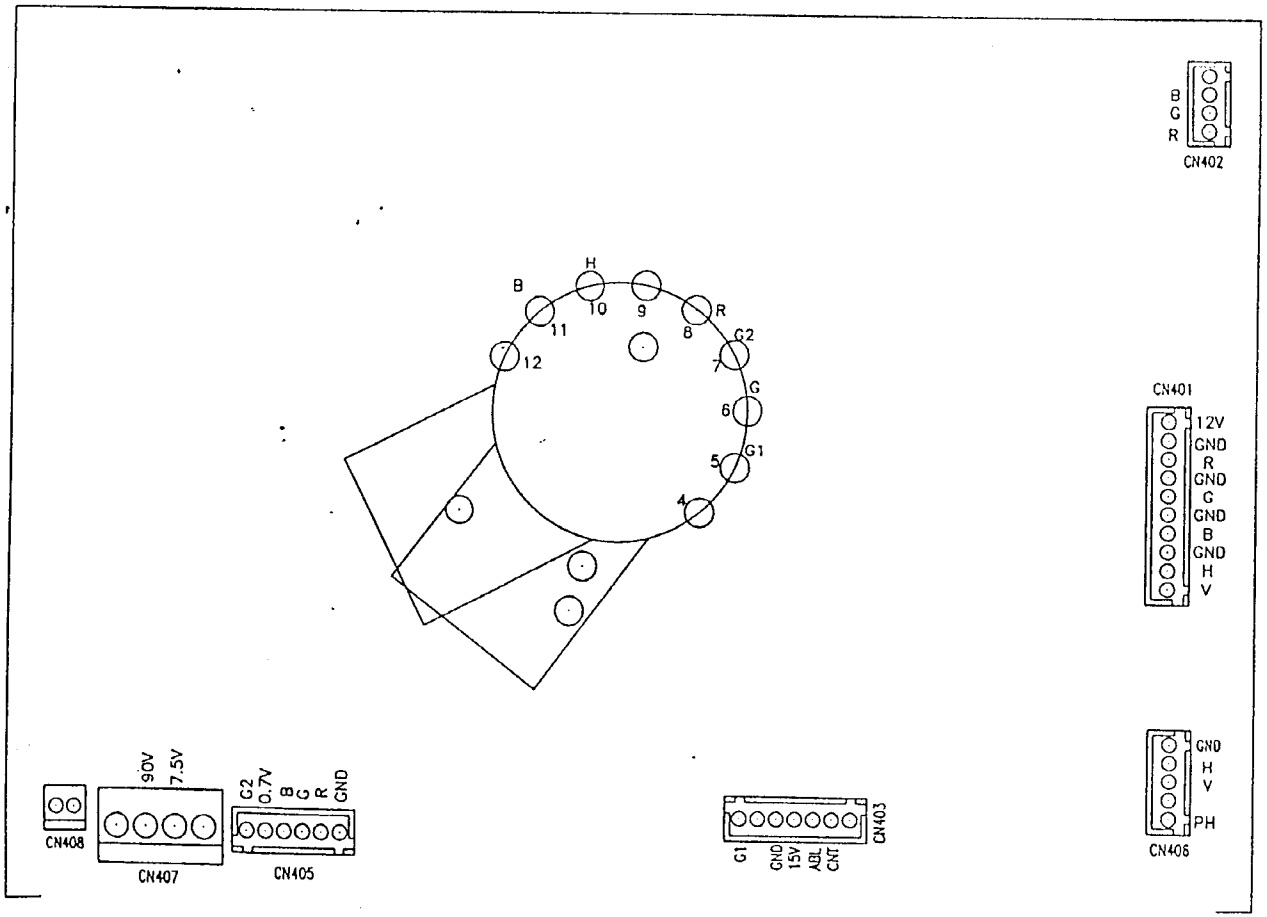



CA-2011
CA-2111
DEFLECTION BD BLOCK DIAGRAM
SIND PIN TRAPEZIOD UNBLANCE CONTROL U109 LM324
VERTICAL PINCUSHION CORRECTION U103 AN5766K
V-C
V-CENTER CONTROL U302 LM324 Q301 B649A Q302 D669A
PARABOLA GENERATION U109,LM324
H-SYNC.
V-SYNC.
H/V SYNC. PROCESSER U302 LM324 U303 LM339 Q304,305 C1815
H-F/V V-SYNC.
H-SYNC.
V-SIZE
V-CENTER
V-SIZE CONTROL U302 LM324
V-OSC.O/P H-OSC U301 STK79905C
V-YOKE
ADDER Q124 D669A Q125 D1138
B1+
H-P
H-S
H-PHASE H-SIZE CONTROL U201 LM324
H-O/P Q215 C3997
H-DRIVER Q216 K1113
H-CENTER Q131 D669A Q132 B649A
210V
DC-DC CONVERTER U202 NE555 Q201 IRF740
B1+
CLP
H-F/V GENERATOR U302,303 LM324 U306,307 LM324
H-YOKE
H-DRIVER Q109 K1113
CRT ANODE
DC-DC CONVERTER U102 NE555 Q110 IRF740
B2+
HIGH-VOLTAGE Q108 C4923
F B T
B2+
FEEDBACK U107 TL431
V
H
DYNAMIC FOCUS Q117 C3675
CRT DYN. FOCUS
CNT.
BRI.
CONTRAST BRIGHTNESS CONTROL U101 LM358
CRT BD.
SPOT-KILLER Q102 BF420
H-CS SWITCH U306,307 LM324 Q214,217 IRF640 Q218,223 IRF640 Q224,225 IRF640
G1

CA-2011 CRT BD BLOCK DIAGRAM



CA-2011 CRT BD VR LOCATION



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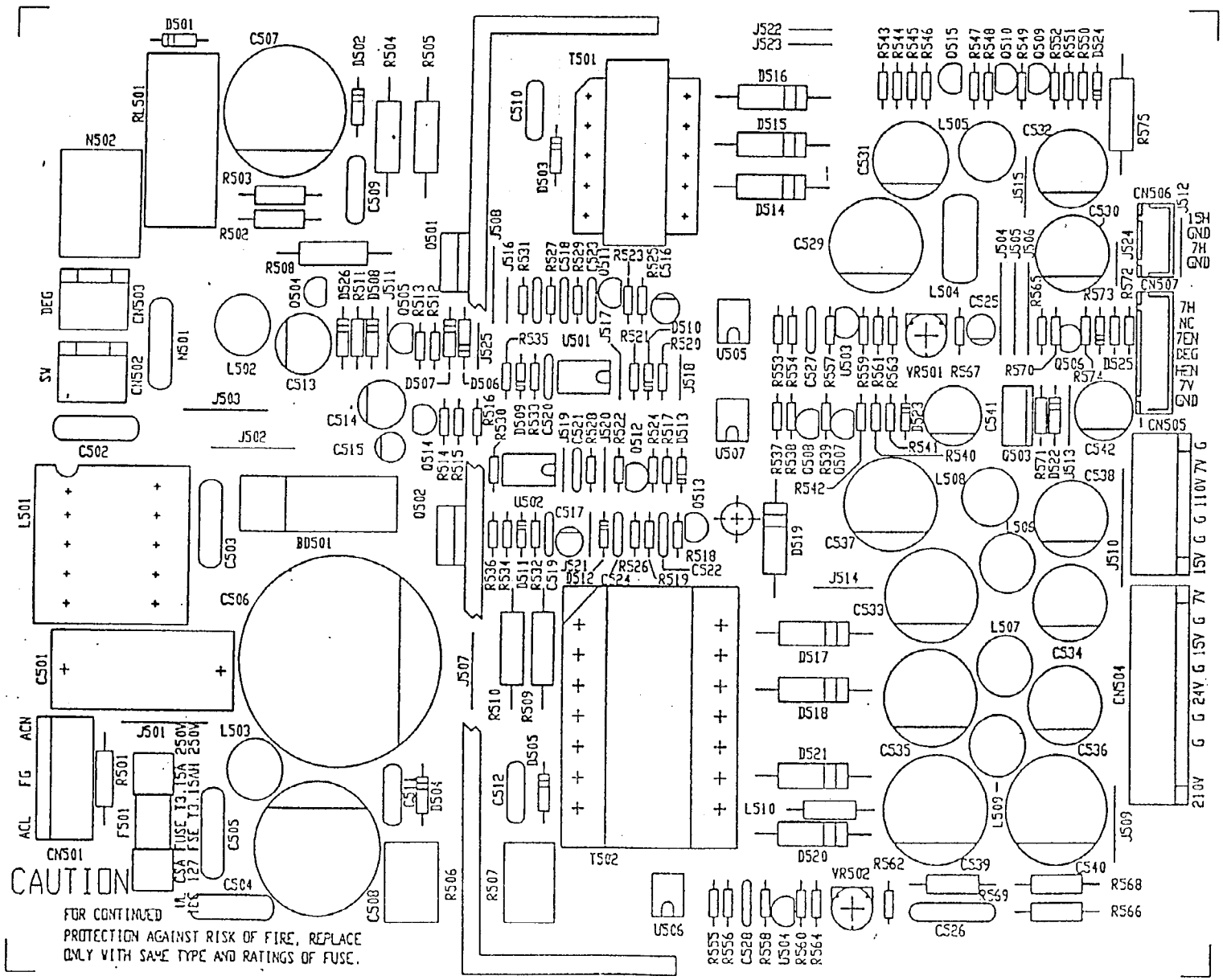
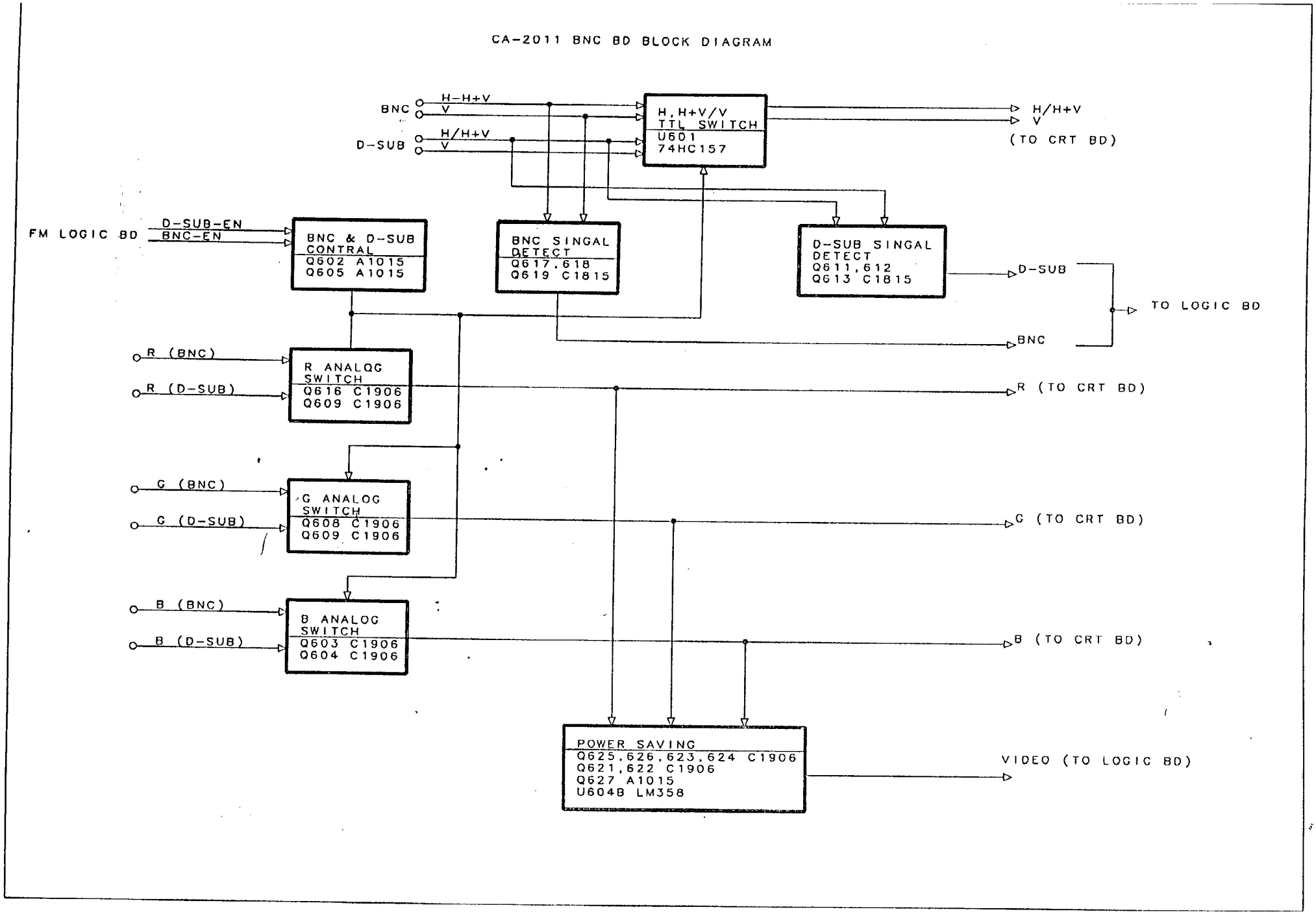
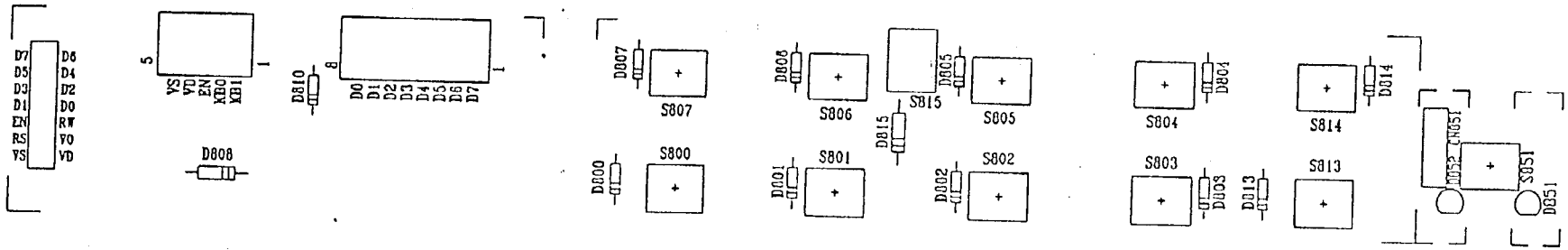
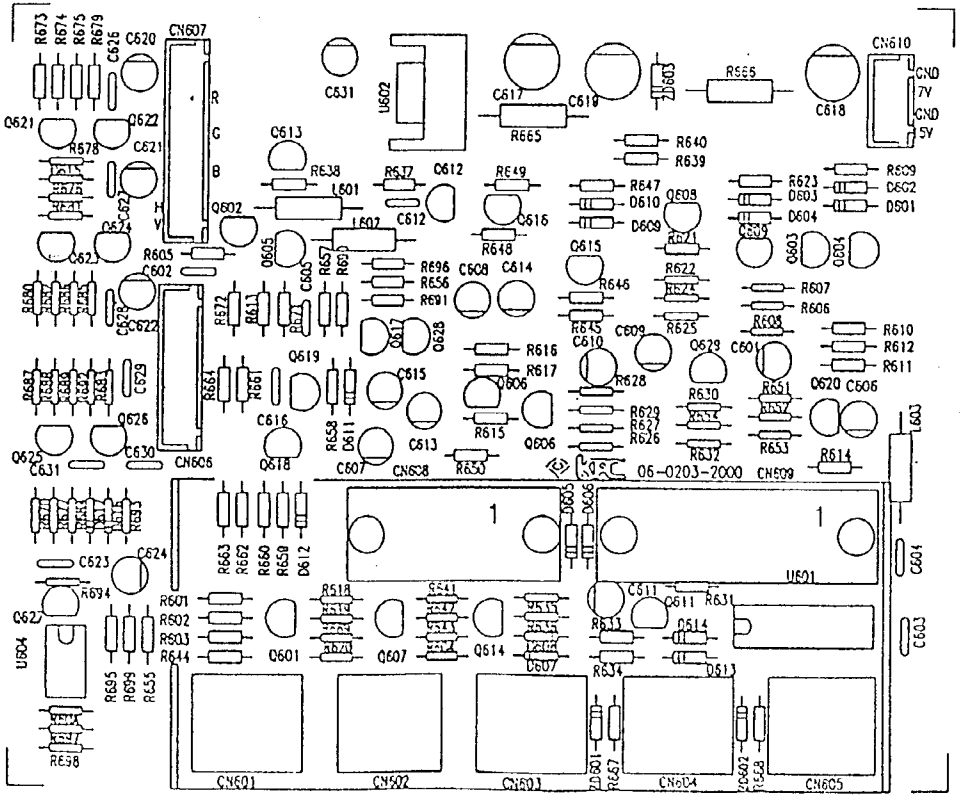
CA-2011 POWER BD



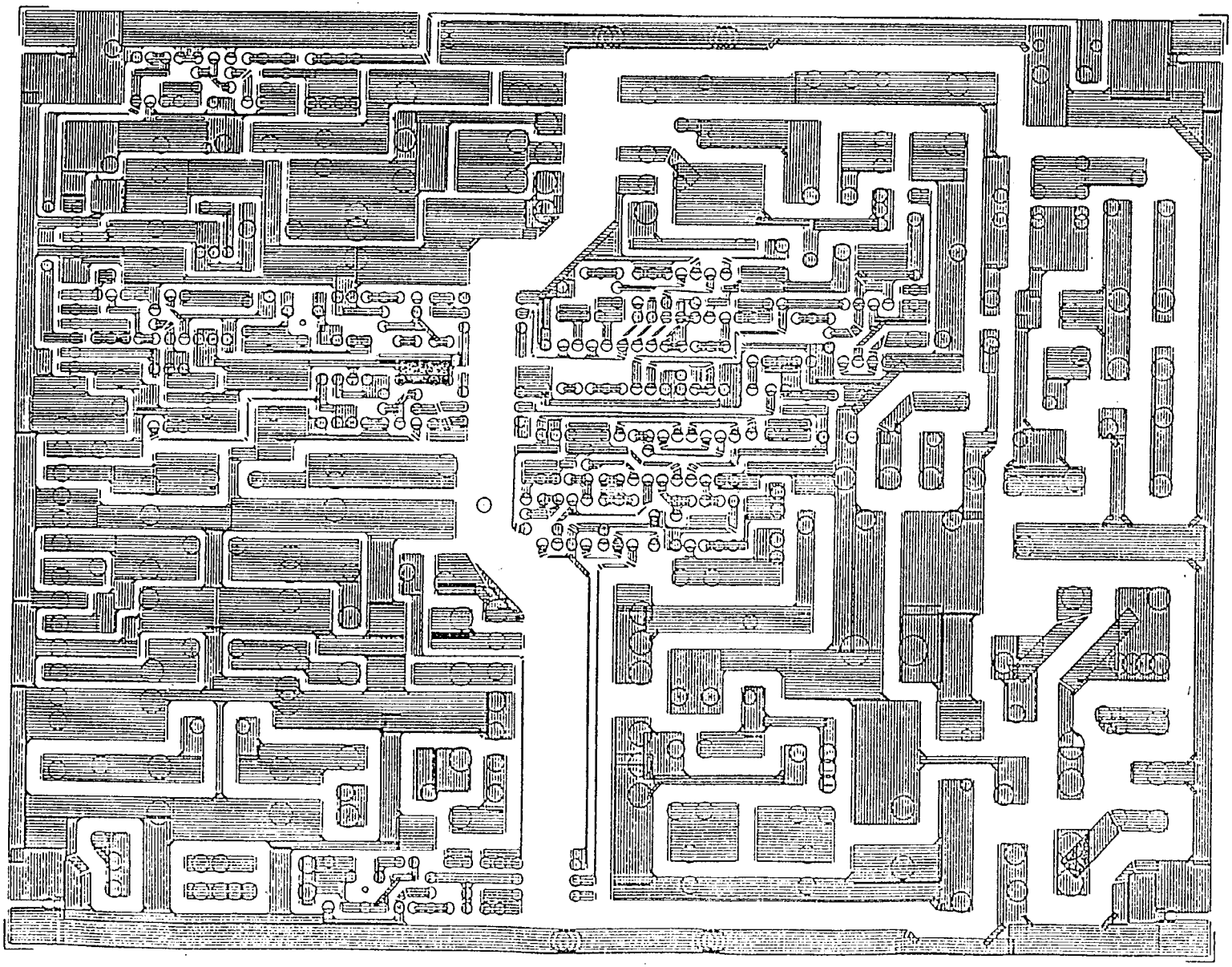

CA-2011 BNC BD BLOCK DIAGRAM
BNC
H-H+V
V
D-SUB
H/H+V
V
H,H+V/V
TTL SWITCH
U601
74HC157
H/H+V
V
(TO CRT BD)
FM LOGIC BD
D-SUB-EN
BNC-EN
BNC & D-SUB
CONTRAL
Q602 A1015
Q605 A1015
BNC SINGAL
DETECT
Q617,618
Q619 C1815
D-SUB SINGAL
DETECT
Q611,612
Q613 C1815
D-SUB
TO LOGIC BD
BNC
R (BNC)
R (D-SUB)
R ANALOG
SWITCH
Q616 C1906
Q609 C1906
R (TO CRT BD)
G (BNC)
G (D-SUB)
G ANALOG
SWITCH
Q608 C1906
Q609 C1906
G (TO CRT BD)
B (BNC)
B (D-SUB)
B ANALOG
SWITCH
Q603 C1906
Q604 C1906
B (TO CRT BD)
POWER SAVING
Q625,626,623,624 C1906
Q621,622 C1906
Q627 A1015
U604B LM358
VIDEO (TO LOGIC BD)

CA-2011 BNC BD & KEY BD

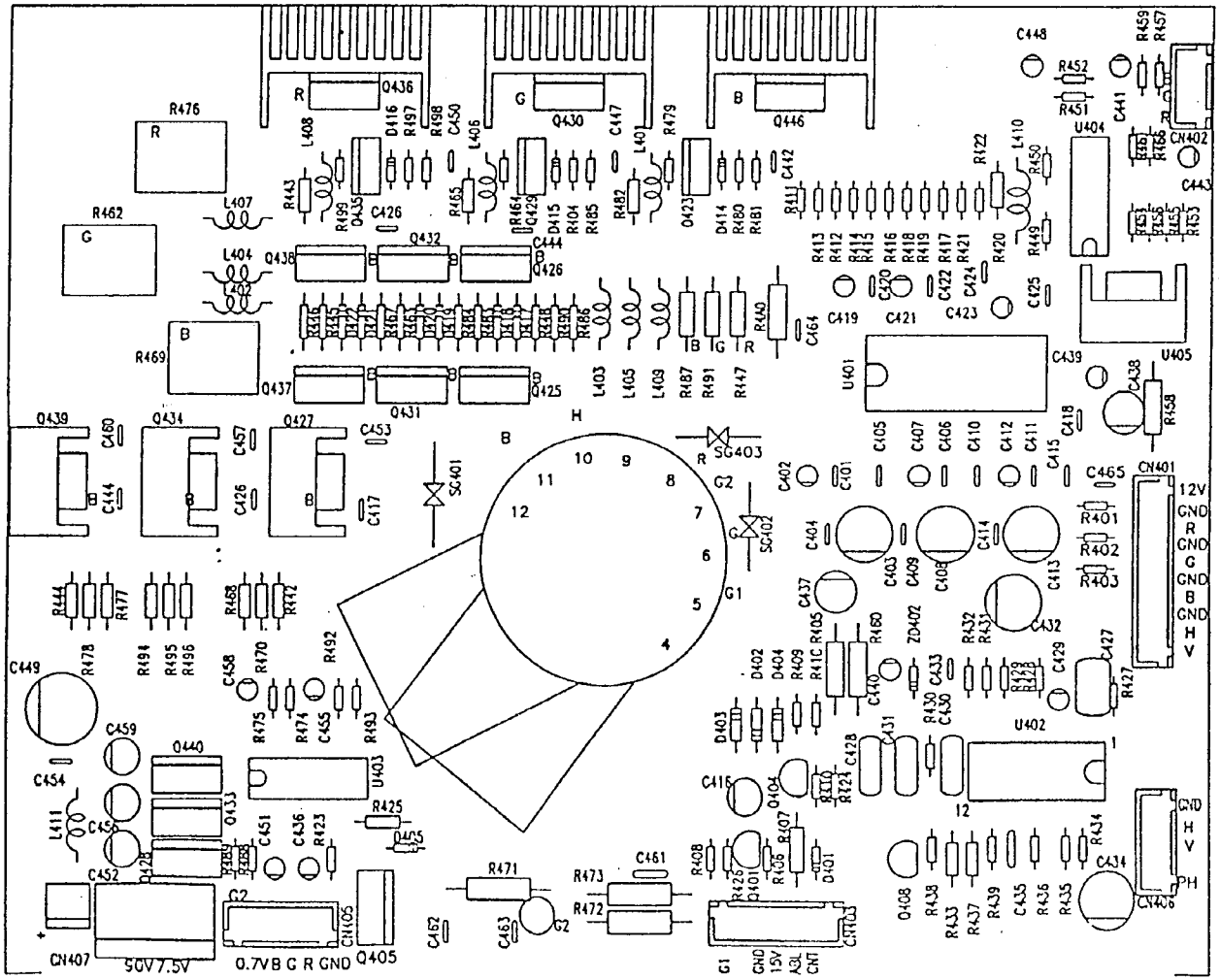




CA-2111
CA-2011 POWER BD



CA-2011 CRT BD



CA-2011 CRT BD

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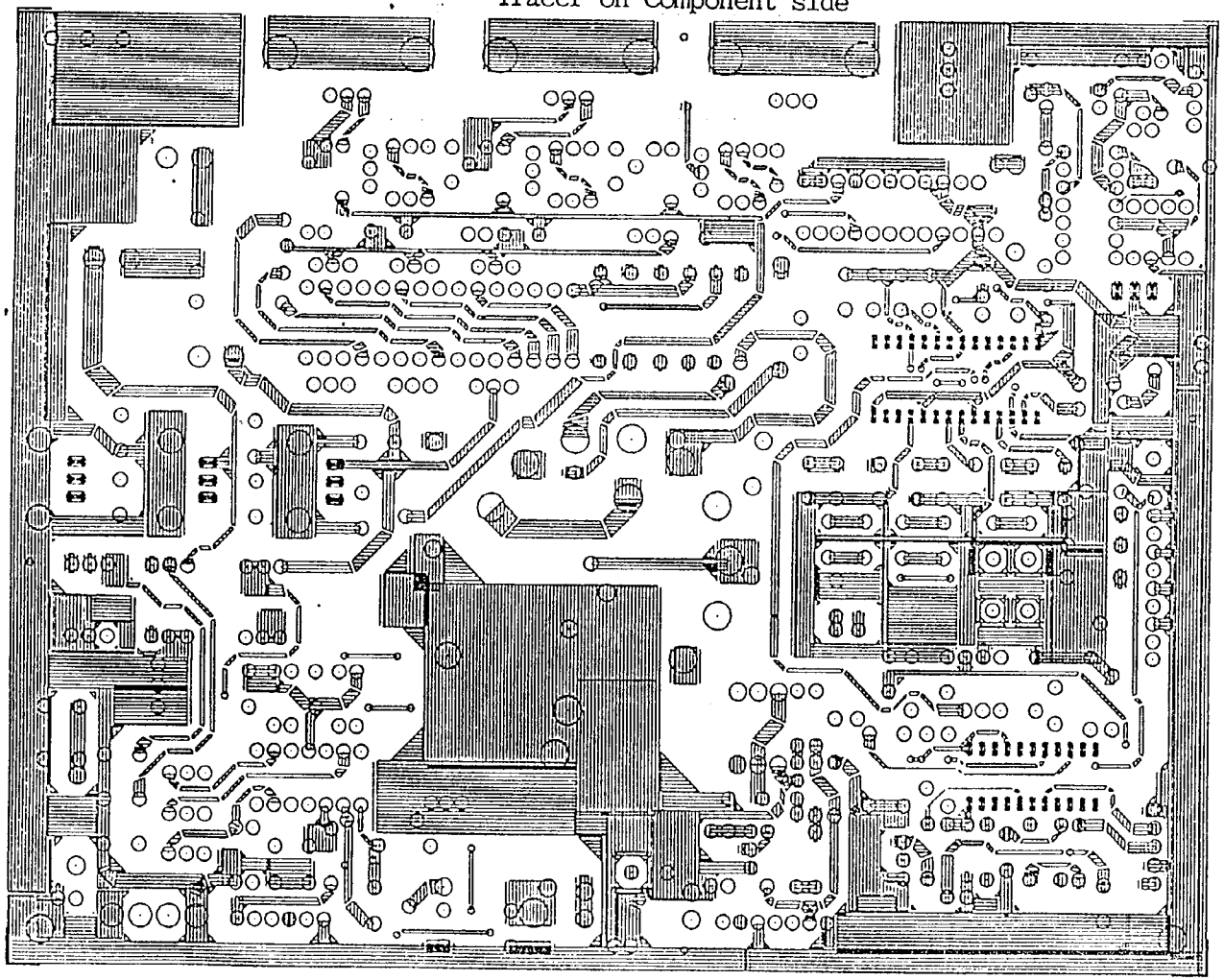
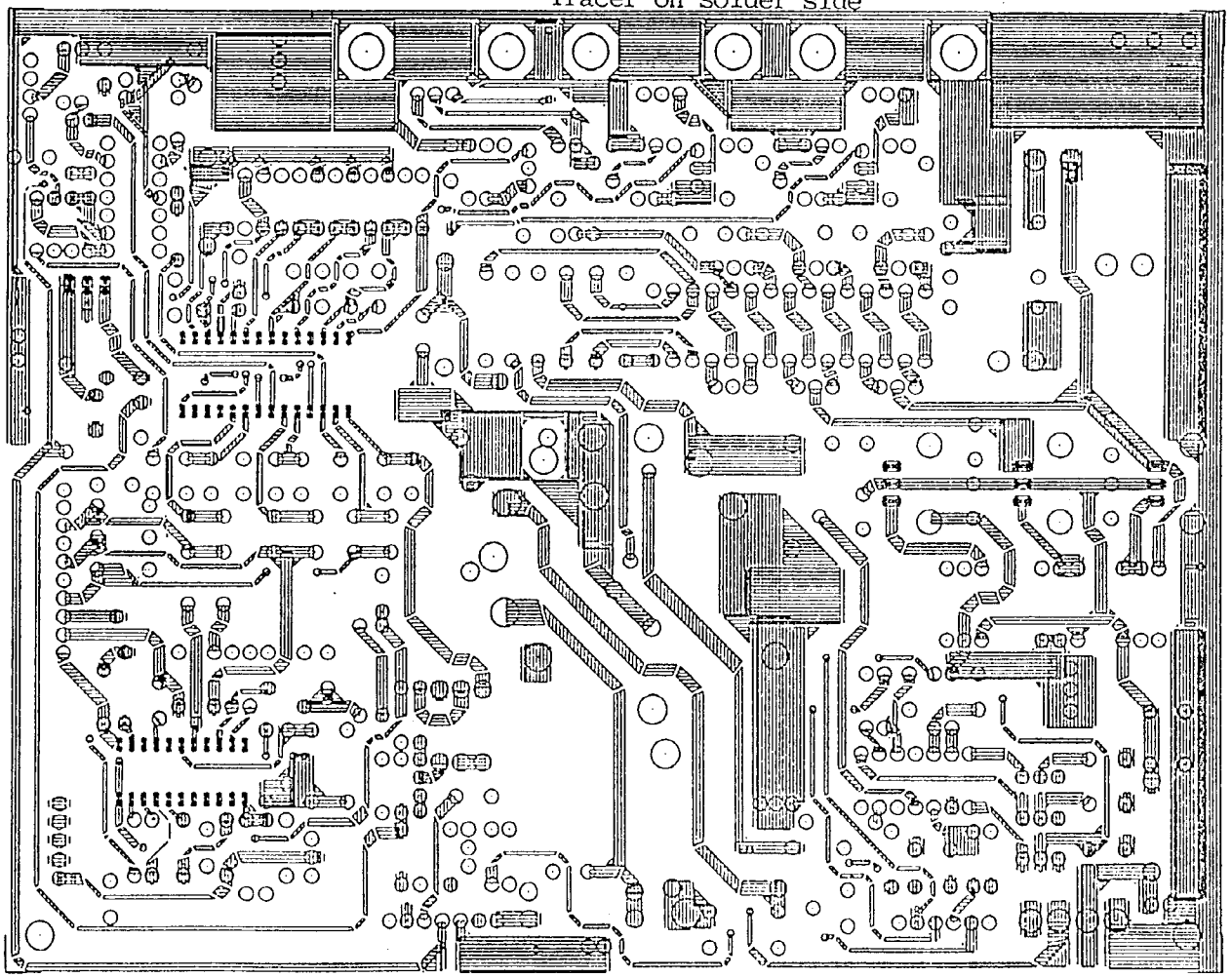


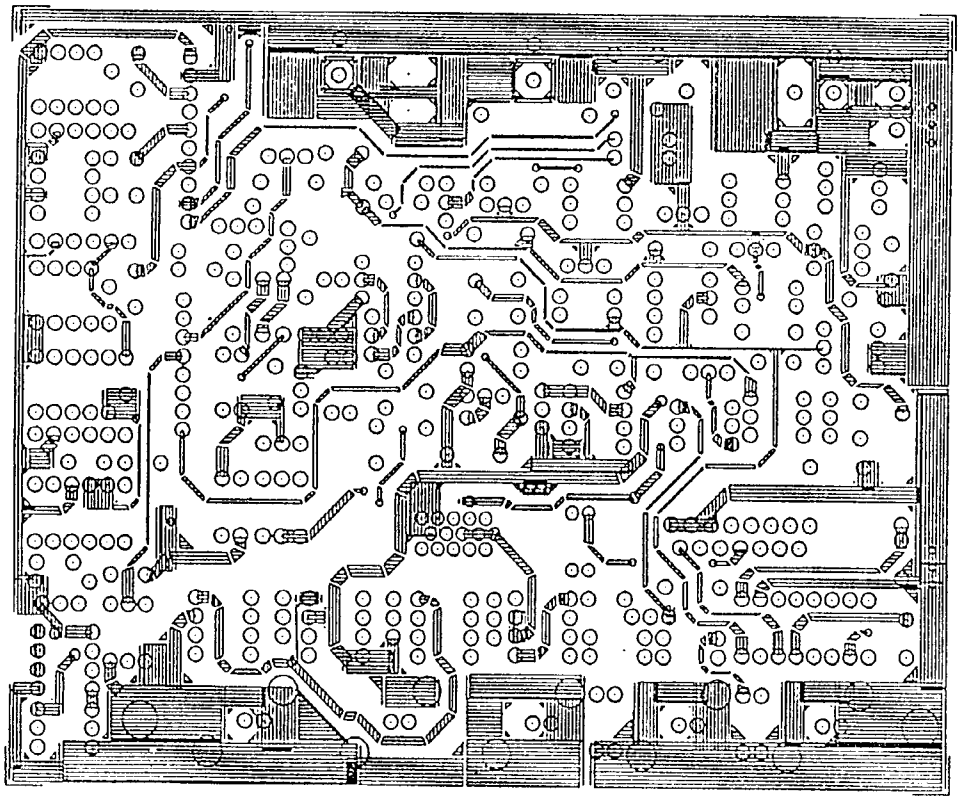
CA-2011 CRT BD

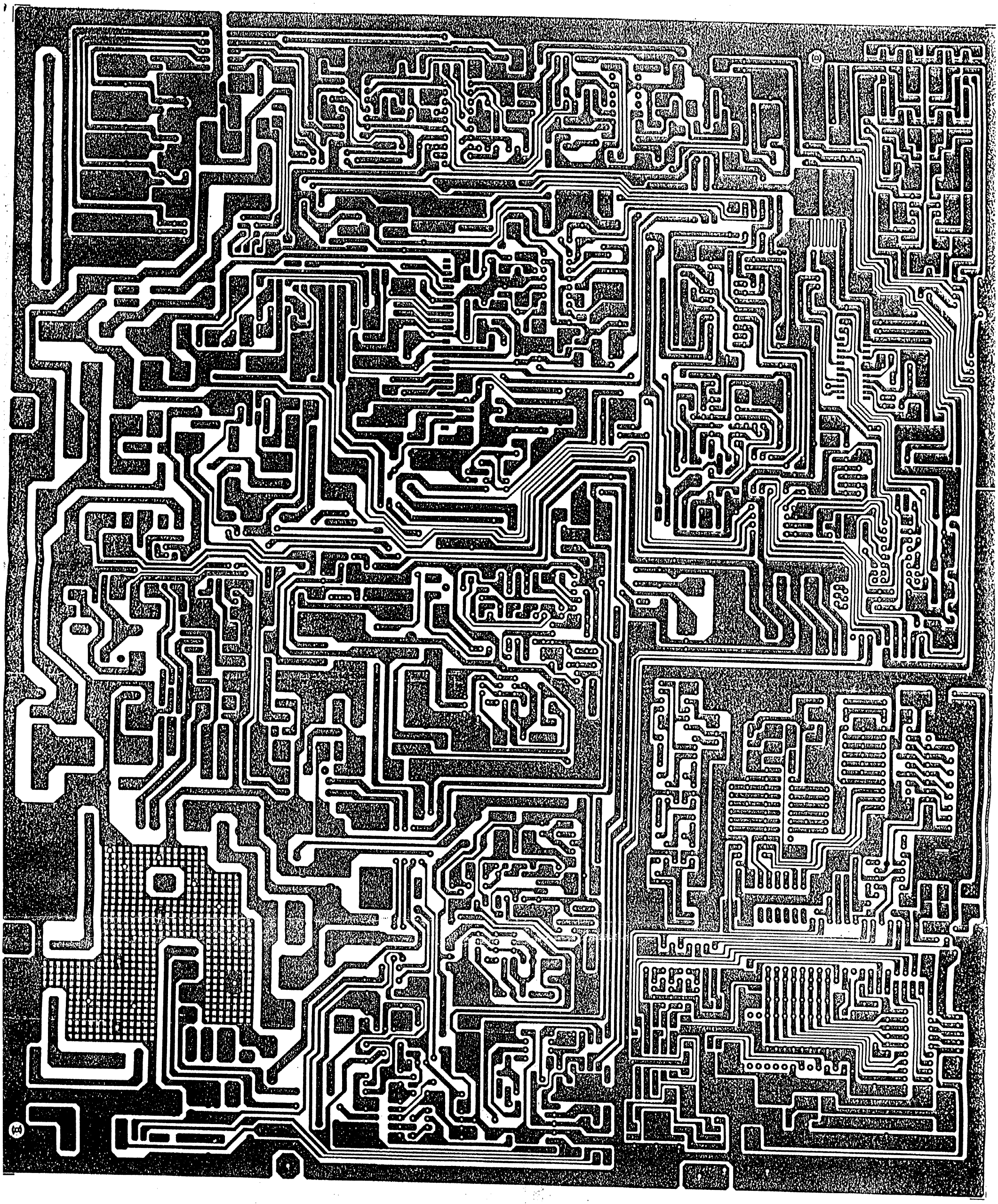
Tracer on solder side



CA-2011 BNC BD

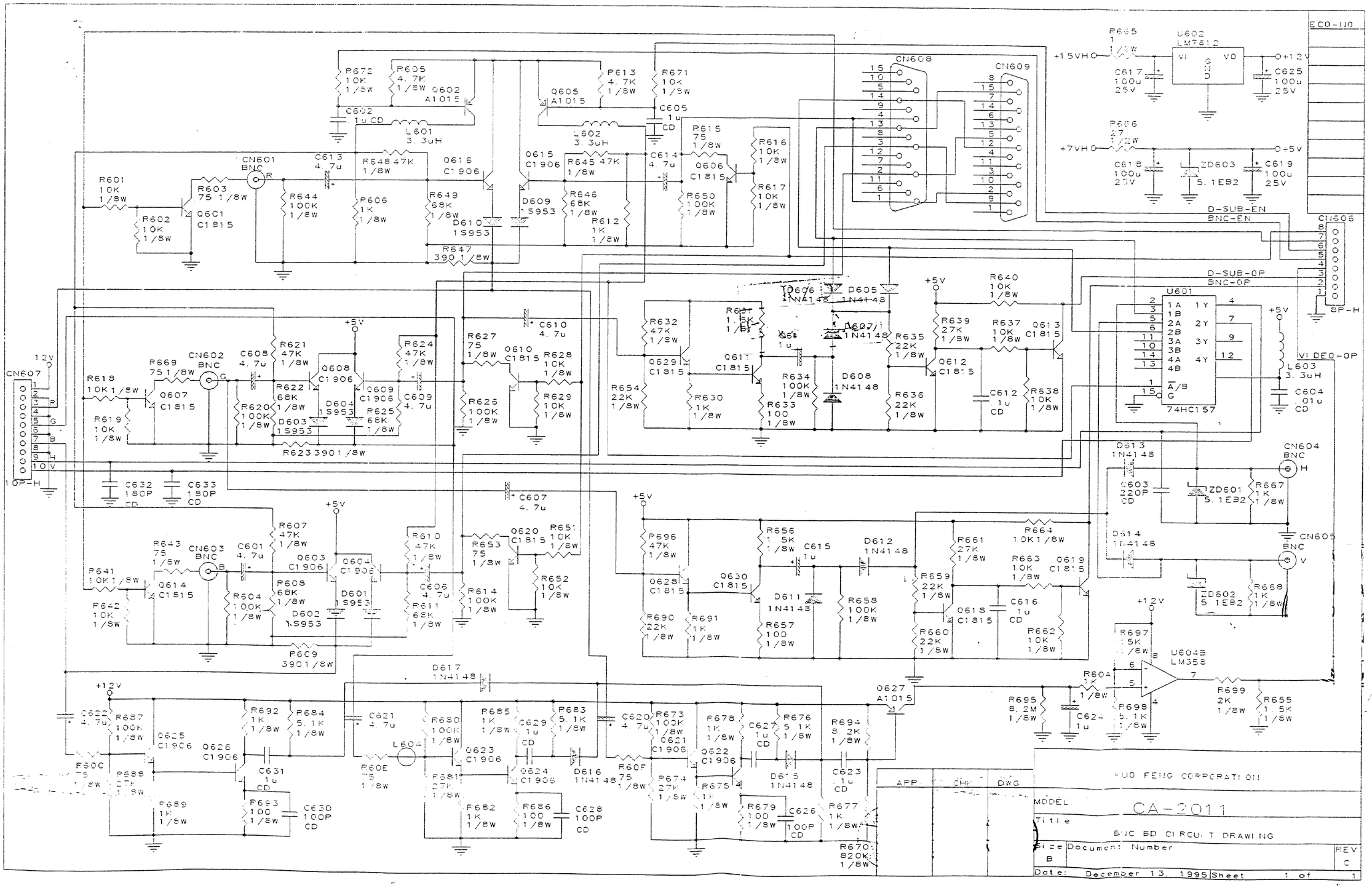
Tracer on Compenet side





CA-2011
CA-2111

MAIN BD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+12V
+7VH
+5V
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BNC-EN
D-SUB-0P
BNC-0P
VIDEO-0P
CN606
8P-H
U601
74HC157
U604B
LM358
CN601
CN602
CN603
CN604
CN605
CN607
10P-H
ZD603
5.1EB2
ZD601
ZD602
L601
3.3uH
L602
3.3uH
L603
3.3uH
L604
Q605
A1015
Q606
C1815
Q607
C1815
Q608
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Q609
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C1815
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Q613
C1815
Q614
C1815
Q615
C1906
Q616
C1906
Q618
C1815
Q619
C1815
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C1815
Q621
C1906
Q622
C1906
Q623
C1906
Q624
C1906
Q625
C1906
Q626
C1906
Q627
A1015
Q628
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1N4148
D615
1N4148
D616
1N4148
D617
1N4148
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R603 75 1/8W
R604 100K 1/8W
R605 4.7K 1/8W
R606 1K 1/8W
R607 47K 1/8W
R608 68K 1/8W
R609 3901/8W
R610 47K 1/8W
R611 68K 1/8W
R612 1K 1/2W
R613 4.7K 1/8W
R614 100K 1/8W
R615 75 1/8W
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R623 3901/8W
R624 47K 1/8W
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R627 75 1/8W
R628 10K 1/8W
R629 10K 1/8W
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R692 1K 1/8W
R693 100 1/8W
R694 8.2K 1/8W
R695 8.2M 1/8W
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R697 1.5K 1/8W
R698 5.1K 1/8W
R699 2K 1/8W
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C602 1u CD
C603 220P CD
C604 .01u CD
C605 1u CD
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C607 4.7u
C608 4.7u
C609 4.7u
C610 4.7u
C611 1u
C612 .1u CD
C613 4.7u
C614 4.7u
C615 1u
C616 1u CD
C617 100u 25V
C618 100u 25V
C619 100u 25V
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C621 4.7u
C622 4.7u
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C624 1u
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C629 1u CD
C630 100P CD
C631 1u CD
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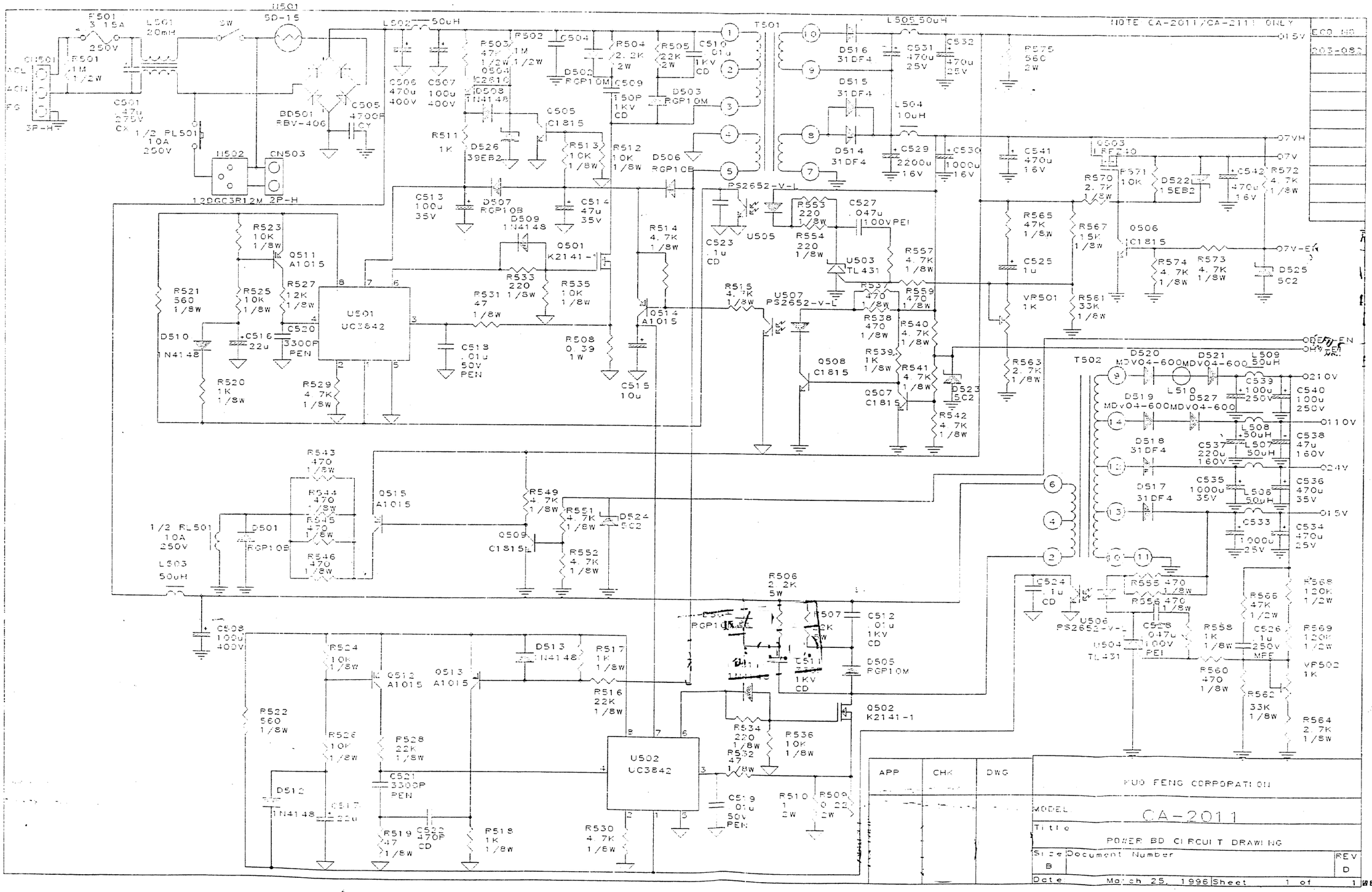
CHK
DWG
FUO FENG CORPORATION
MODEL
CA-2011
Title
BNC BD CIRCUIT DRAWING
Size
B
Document Number
REV
C
Date: December 13, 1995
Sheet 1 of 1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CN501
AC L
AC N
FG
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1M
1/2W
C501
.47u
275V
CX
1/2 FL501
10A
250V
BD501
5BV-406
C505
4700P
CY
U502
CN503
12P6C3R12M 2P-H
L502 50uH
C506
470u
400V
C507
100u
400V
R503
47K
1/2W
R502
1M
1/2W
0504
C2610
D508
1N4148
C504
D502
RGP10M
R504
2.2K
2W
C509
150P
1KV
CD
R505
22K
2W
C510
.01u
1KV
CD
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C505
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D509
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1/8W
R531
47
1/8W
R535
10K
1/8W
R508
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1W
C518
.01u
50V
PEN
C515
10u
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R523
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A1015
R521
560
1/8W
R525
10K
1/8W
R527
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1/8W
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22u
C520
3300P
PEN
R520
1K
1/8W
R529
4.7K
1/8W
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UC3842
L505 50uH
D516
31DF4
C531
470u
25V
C532
470u
25V
R575
560
2W
D515
31DF4
D514
31DF4
L504
10uH
C529
2200u
16V
C530
1000u
16V
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C523
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R554
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1/8W
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1/8W
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1/8W
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1/8W
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1/8W
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Q507
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1/8W
C541
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1/8W
C525
1u
R567
1.5K
1/8W
VR501
1K
R561
33K
1/8W
R563
2.7K
1/8W
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R570
2.7K
1/8W
R571
10K
D522
15EB2
C542
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16V
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4.7K
1/8W
Q506
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1/8W
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1/8W
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07V
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015V
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D521
MDV04-600
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L510
D519
MDV04-600
D527
MDV04-600
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100u
250V
C540
100u
250V
021V
0110V
D518
31DF4
C537
220u
160V
L507 50uH
C538
47u
160V
024V
D517
31DF4
C535
1000u
35V
L506 50uH
C536
470u
35V
015V
C533
1000u
25V
C534
470u
25V
L508
50uH
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R545
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1/8W
R546
470
1/8W
D515
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1/2 RL501
10A
250V
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50uH
D501
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1/8W
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2.2K
5W
C508
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10K
1/8W
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Q513
A1015
D513
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1/8W
R516
22K
1/8W
C512
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1KV
CD
D505
RGP10M
C511
1KV
CD
Q502
K2141-1
R522
560
1/8W
R526
10K
1/8W
R528
22K
1/8W
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PEN
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.22u
R519
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1/8W
C522
470P
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1/8W
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UC3842
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R536
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1/8W
R532
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1/8W
C519
.01u
50V
PEN
R530
4.7K
1/8W
R510
1
2W
R509
0.22
2W
C524
.1u
CD
R555 470
1/8W
R556 470
1/8W
U506
PS2652-V-L
U504
TL431
C528
.047u
100V
PEI
R558
1K
1/8W
C526
.1u
250V
MFE
R560
470
1/8W
R562
33K
1/8W
R568
120K
1/2W
R566
47K
1/2W
R569
120K
1/2W
VR502
1K
R564
2.7K
1/8W
APP
CHK
DWG
FUU FENG CORPORATION
MODEL
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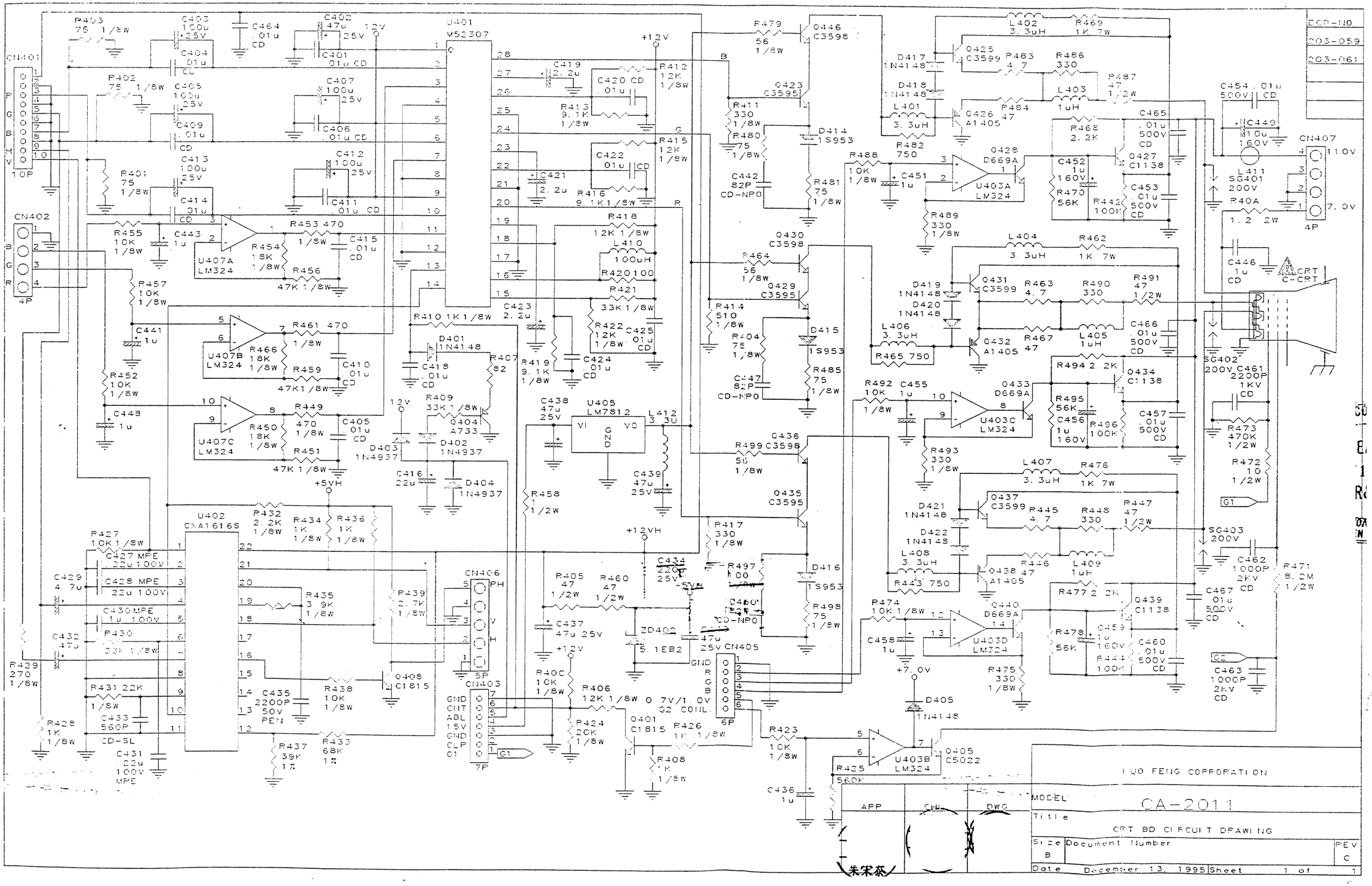
Title
POWER BD CIRCUIT DRAWING
Size
B
Document Number
REV
D
Date
March 25, 1996
Sheet
1 of
1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CN403
CN405
CN406
CN407
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U402 CXA1616S
U403A LM324
U403B LM324
U403C LM324
U403D LM324
U405 LM7812
U407A LM324
U407B LM324
U407C LM324
+12V
+5VH
+12VH
+7.0V
+5VH
CRT
C-CRT
G1
G2
CCD-NO
203-059
203-061
MODEL CA-2011
Title CRT BD CIRCUIT DRAWING
TUO FENG CORPORATION
APP
CHK
DWG
Size B
Document Number
REV C
Date December 13, 1995
Sheet 1 of 1

ECO-NO

CN404
2P-H
SG401
200V

CN405
2P-H
SG402
200V

CN406
2P-H
SG403
200V

CN403
2P-H
C404
.1u
CD
R410
1.5
2W
C405
.1u
CD

R
G
B

CRT

D401
1N4148

CN401
3P-H
Q401
C5022

G2
R403
8.2M
1/2W
C402
1000P
2KV
CD
C403
1000P
2KV
CD

CN402
2P-H
R401
10
1/2W
R402
470K
1/2W
C401
1000P
1KV
CD

APP	CHK	DWG

FUO FENG CORPORATION

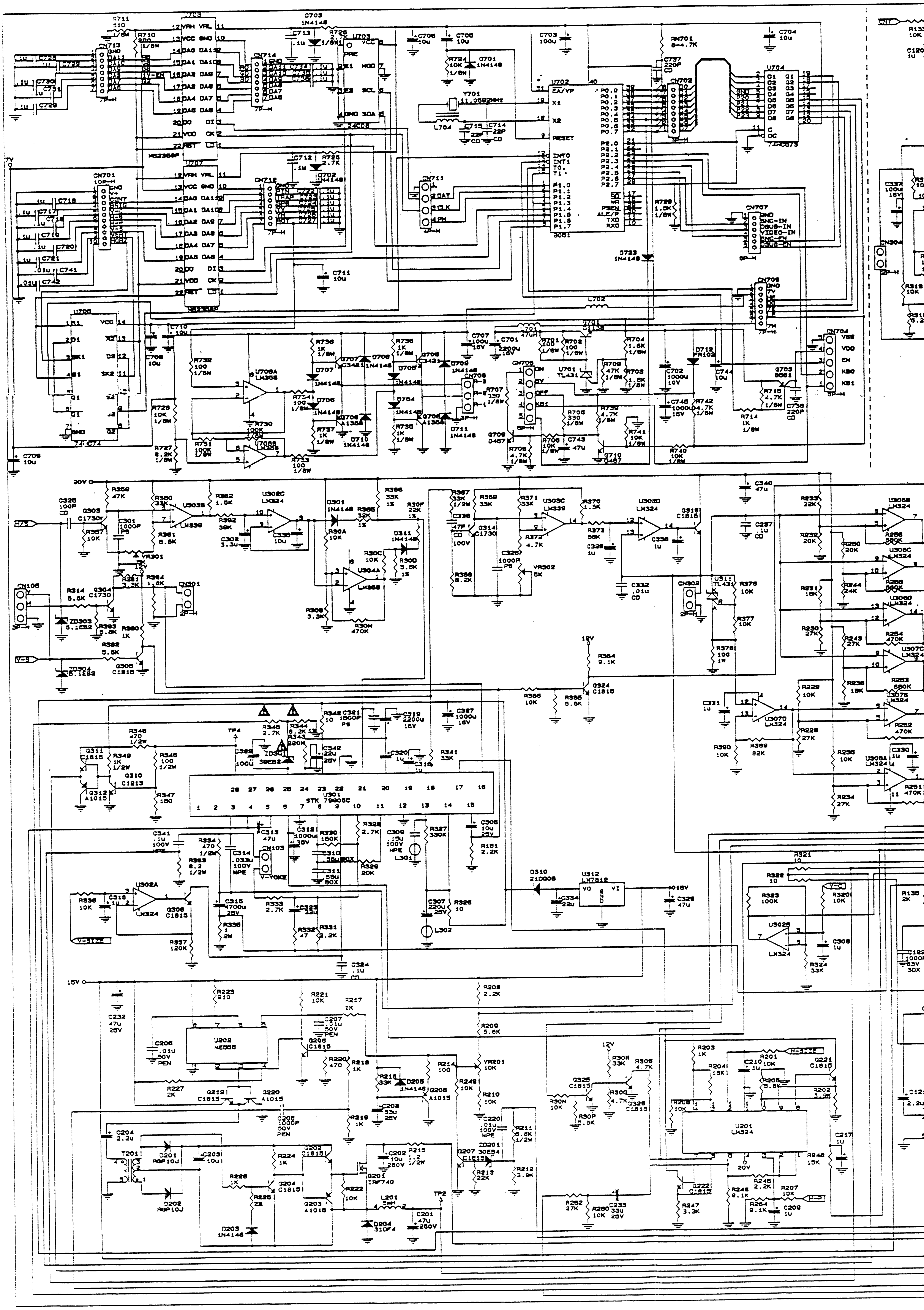
MODEL CA-2111

Title CRT BD CIRCUIT DRAWING

Size	Document Number	REV
B		C

Date: May 16, 1996 Sheet 1 of 1

FBB MAINBOARD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CN707
CN709
CN711
CN712
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U303B
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U304A
LM358
U302A
LM324
U302B
LM324
U312
LM7812
U202
NE555
U201
LM324
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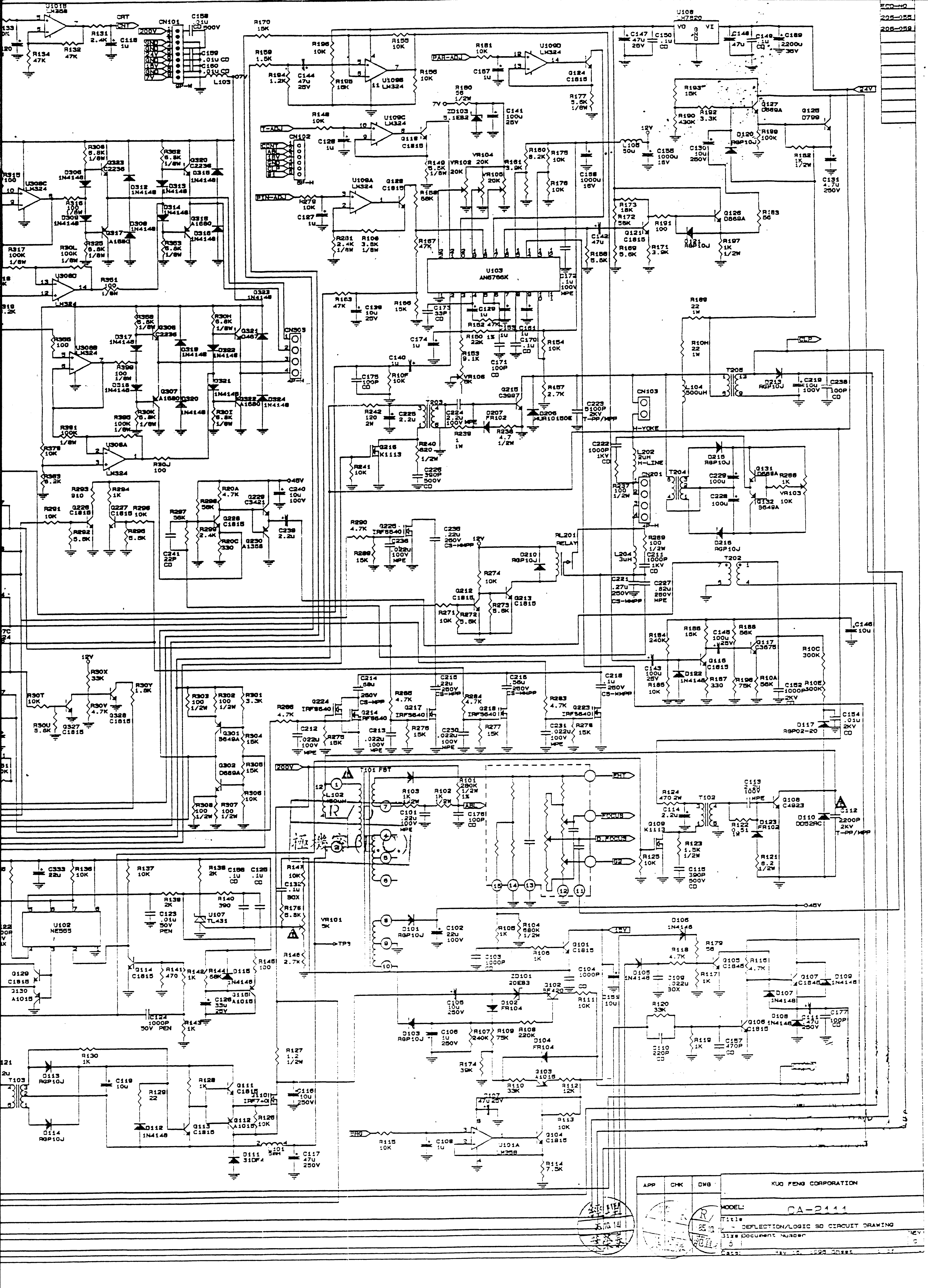
12V
H-S
V-S
V-YOKE
TP2
TP4

MC-Service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CHK
DWG
MODEL:
Title
DEFLECTION/LOGIC BD CIRCUIT DRAWING
Size Document Number
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U102
NE555
U108
LM7820
T101 FBT
T102
T202
T203
T204
T205
CN101
CN102
CN103
CN201
CN303
RL201
RELAY
H-YOKE
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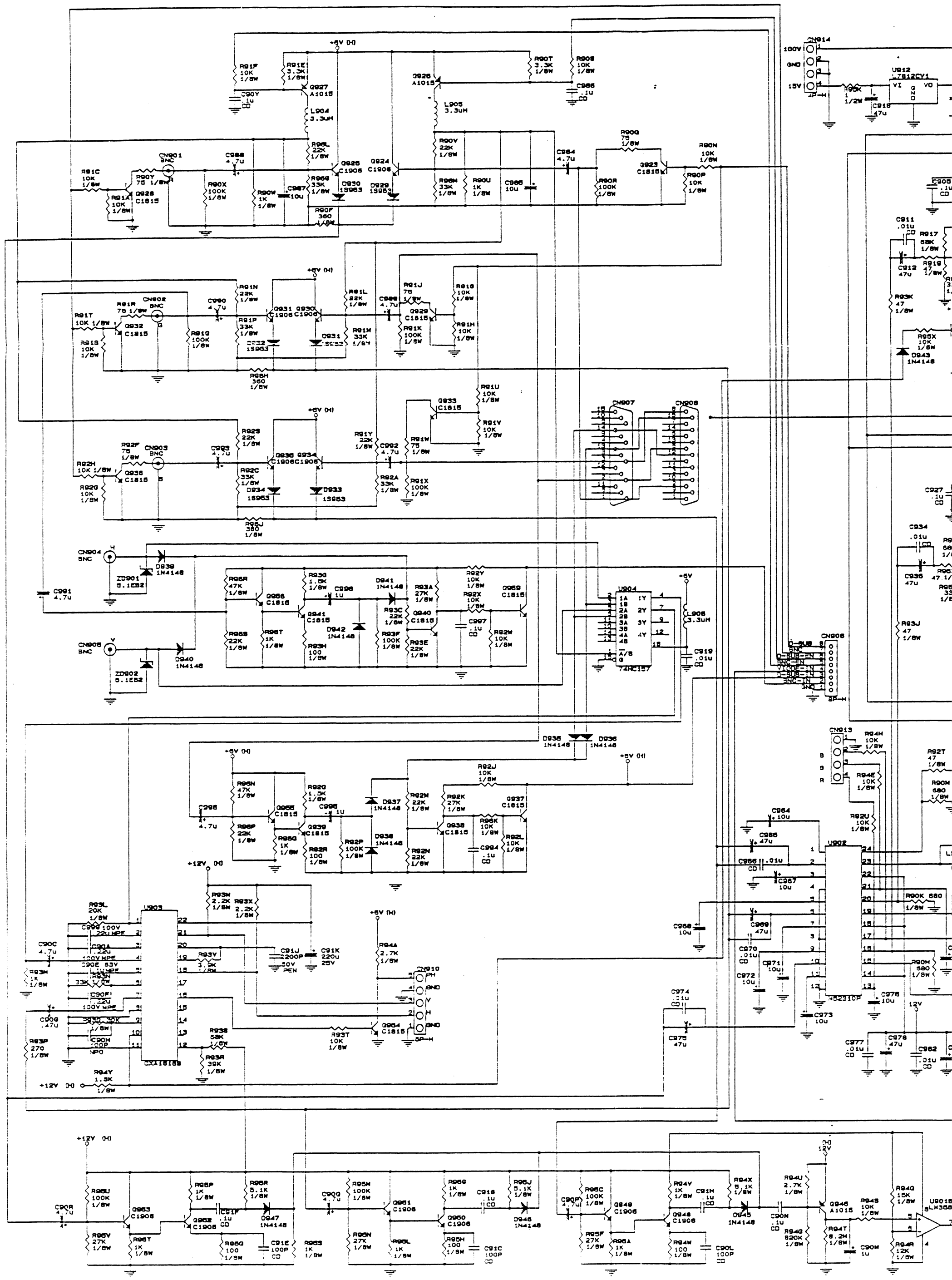
CLP
EHT
FOCUS
D.FOCUS
G2
ABL
12V
045V

MC-Service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R91E 3.3K 1/8W
Q927 A1015
C90Y .1u CD
L904 3.3uH
L905 3.3uH
R90T 3.3K 1/8W
R90S 10K 1/8W
C986 .1u CD
Q926 A1015
R90L 22K 1/8W
R90V 22K 1/8W
CN901 BNC
C988 4.7u
C984 4.7u
R90Q 75 1/8W
R90N 10K 1/8W
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R90Y 75 1/8W
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R91A 10K 1/8W
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R90W 1K 1/8W
C987 10u
R90G 33K 1/8W
D930 1S953
D929 1S953
Q925 C1906
Q924 C1906
R90M 33K 1/8W
R90U 1K 1/8W
C985 10u
R90R 100K 1/8W
Q923 C1815
R90P 10K 1/8W
R90F 360 1/8W
CN914
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GND
15V
R95K 1/2W
C918 47u
U912 7812CV1
VI
VO
GND
C905 .1u CD
C911 .01u CD
R917 68K 1/8W
C912 47u
R919 47 1/8W
R93K 47 1/8W
R95X 10K 1/8W
D943 1N4148
+5V (H)
R91N 22K 1/8W
R91L 22K 1/8W
C990 4.7u
R91J 75 1/8W
C989 4.7u
R91T 10K 1/8W
R91R 75 1/8W
CN902 BNC
Q932 C1815
R91S 10K 1/8W
R910 100K 1/8W
R91P 33K 1/8W
D932 1S953
Q931 C1906
Q930 C1906
D931
R91M 33K 1/8W
Q929 C1815
R91K 100K 1/8W
R919 10K 1/8W
R91H 10K 1/8W
R98H 360 1/8W
R91U 10K 1/8W
Q933 C1815
R91V 10K 1/8W
+5V (H)
R92S 22K 1/8W
R92F 75 1/8W
CN903 BNC
C993 4.7u
R92H 10K 1/8W
Q936 C1815
R929 10K 1/8W
R92C 33K 1/8W
Q936 Q934 C1906 C1906
D934 1S953
D933 1S953
R91Y 22K 1/8W
C992 4.7u
R91W 75 1/8W
R92A 33K 1/8W
R91X 100K 1/8W
R98J 360 1/8W
CN907
CN908
CN904 BNC
D939 1N4148
ZD901 5.1ER2
C991 4.7u
R98R 47K 1/8W
Q956 C1815
R93G 1.5K 1/8W
C996 1u
D941 1N4148
R93A 27K 1/8W
R92Y 10K 1/8W
Q959 C1815
R92X 10K 1/8W
Q941 C1815
R93C 22K 1/8W
Q940 C1815
C997 .1u CD
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R98T 1K 1/8W
D942 1N4148
R93H 100 1/8W
R93F 100K 1/8W
R93E 22K 1/8W
R92W 10K 1/8W
CN905 BNC
D940 1N4148
ZD902 5.1ER2
U904
74HC157
+6V
L906 3.3uH
C919 .01u CD
CN906
C934 .01u CD
C935 47u
R93J 47 1/8W
D936 1N4148
D936 1N4148
+5V (H)
+5V (H)
R92J 10K 1/8W
R98N 47K 1/8W
R92Q 1.5K 1/8W
C995 4.7u
C995 1u
D937 1N4148
R92M 22K 1/8W
R92K 27K 1/8W
Q937 C1815
R98P 22K 1/8W
R98Q 1K 1/8W
Q939 C1815
R92R 100 1/8W
R92P 100K 1/8W
D938 1N4148
R92N 22K 1/8W
Q938 C1815
R98K 10K 1/8W
C994 .1u CD
R92L 10K 1/8W
+12V (H)
R93W 2.2K 1/8W
R93X 2.2K 1/8W
R93L 20K 1/8W
U903
CXA1815S
C991J 2200P 50V PEN
C91K 220u 25V
+5V (H)
R94A 2.7K 1/8W
C90C 4.7u
R93M 1K 1/8W
R93V 3.3K 1/8W
C90G .47u
R93P 270 1/8W
R938 58K 1/8W
R93R 39K 1/8W
R94Y 1.5K 1/8W
+12V (H)
CN910
5P-H
R93T 10K 1/8W
Q954 C1815
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C975 47u
C964 .10u
C965 .47u
C966 .01u CD
C967 10u
C968 10u
C969 .47u
C970 .01u CD
C971 10u
C972 10u
C973 10u
C976 10u
C977 .01u CD
C978 47u
C962 .01u CD
R94H 10K 1/8W
R92T 47 1/8W
R94E 10K 1/8W
R90M 680 1/8W
R92U 10K 1/8W
U902
R90K 680 1/8W
R90H 580 1/8W
12V
+12V (H)
R95U 100K 1/8W
C90R 4.7u
Q953 C1906
R95V 27K 1/8W
R96T 1K 1/8W
R96P 1K 1/8W
R96R 5.1K 1/8W
Q952 C1906
C91F .1u CD
D947 1N4148
R95Q 100 1/8W
C91E 100P CD
R953 1K 1/8W
C90Q 4.7u
R95N 100K 1/8W
Q951 C1906
R95N 27K 1/8W
R95L 1K 1/8W
R95G 1K 1/8W
C916 .1u CD
R95J 5.1K 1/8W
Q950 C1906
R95H 100 1/8W
C91C 100P CD
D946 1N4148
C90P 4.7u
R95C 100K 1/8W
Q949 C1906
R95F 27K 1/8W
R96A 1K 1/8W
R94V 1K 1/8W
C91M .1u CD
R94X 5.1K 1/8W
Q948 C1906
R94W 100 1/8W
C90L 100P CD
D945 1N4148
C90N .1u CD
R94U 2.7K 1/8W
Q946 A1015
R94T 8.2M 1/8W
R94S 10K 1/8W
C90M 1u
R94G 820K 1/8W
R94Q 15K 1/8W
R94R 12K 1/8W
U801B LM358
CN913
R94H 10K 1/8W

ECO NO
208-055

U908 VPA12H
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D927 1N4937
D928 1N4937
ZD903 5.1EB2
CN916
CN917
CN918
CN915
CN911
CN912
CN909
L907
L911
L901
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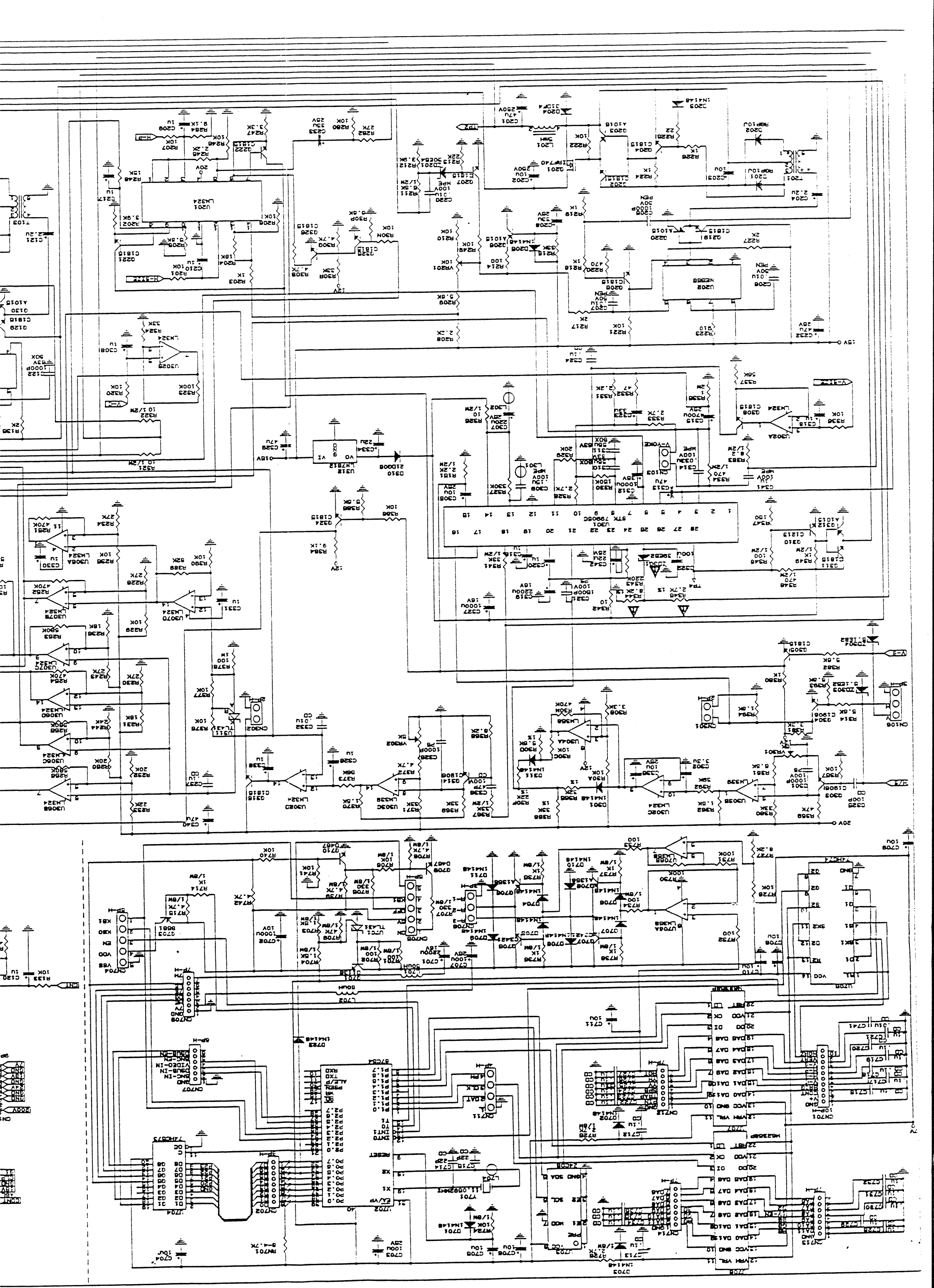
L903
L910
0.7V/1V G2 CTRL.
GND
CLP
ABL
CNT
7V
15V
+12V
12V
5V
(H)
(V)

APP	CHK	DWG	KUO FENG CORPORATION
			MODEL: CA-2111
			Title: VIDEO BD CIRCUIT DRAWING
			Size: Document Number: REV: C



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203-103

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U109D LM324
U108 M7820
U102 NE555
U107 TL431
U101A LM358
CN103 H-YOKE
CN201 4P-H
T101 FBT
T102
T103
T202
T204
T205
L101 5mH
L102 450uH
L104 500uH
L105 50uH
L106
L202 2.9uH H-LINE
L204 5.2uH
RL201 10A 250V
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ZD103 5.1E82
D101 RGP10J
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D103 RGP10J
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MODEL: CA-2011
DEFLECTION/LOGIC 3D CIRCUIT DRAWING
Size Document Number
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